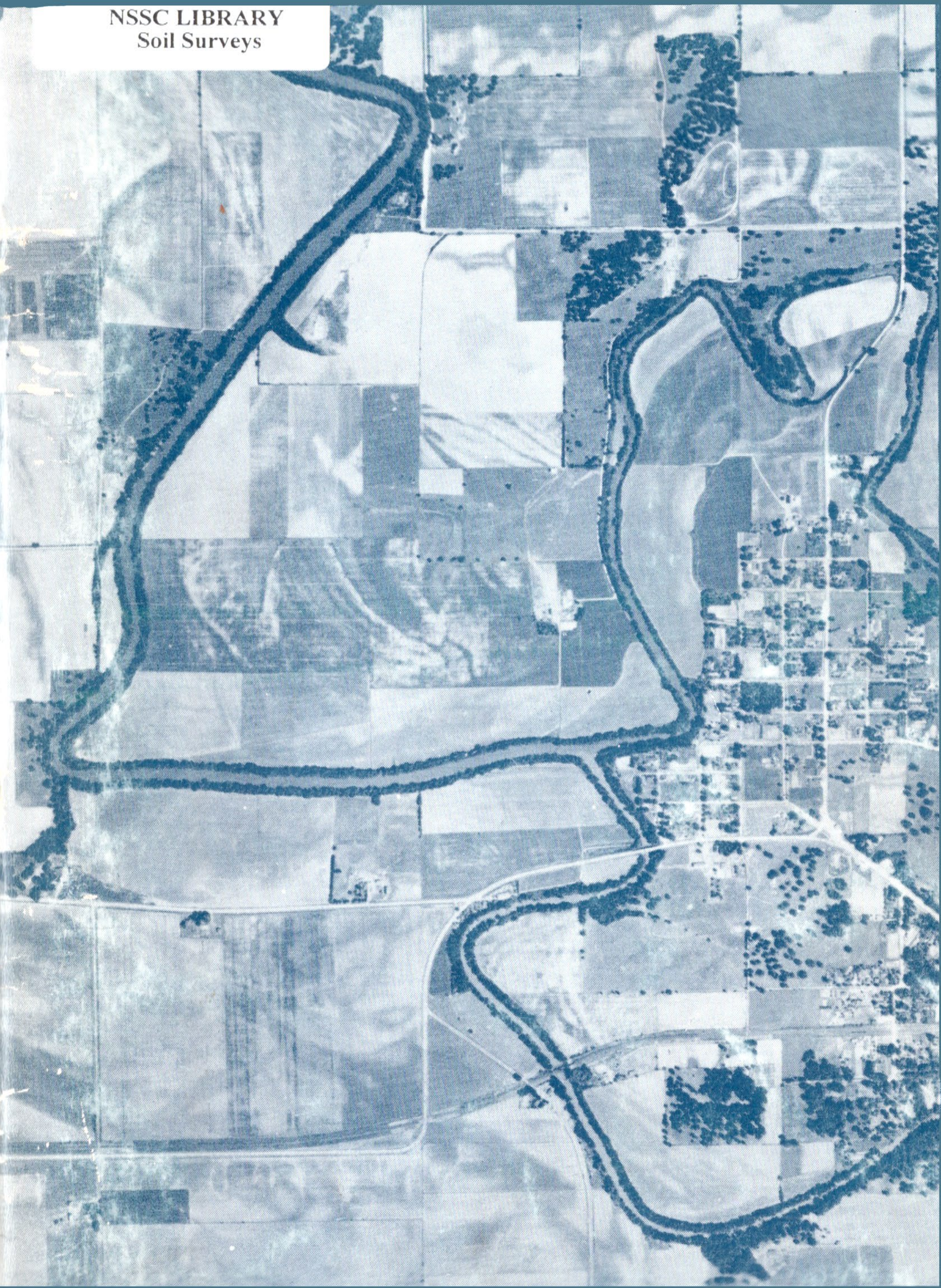
IROQUOIS COUNTY SOILS



SOIL REPORT 74

UNIVERSITY OF ILLINOIS
AGRICULTURAL EXPERIMENT STATION

COVER PICTURE

The picture on the cover of this report shows how a part of Iroquois county appears from the air. The northwest corner of Watseka shows in the southeast part of the photograph. Iroquois river winds through the upper part and is joined by Sugar creek from the south just above Route 24.

The streaked appearance of the soils is due to the soil material having been deposited by running water. The lighter shadings show soils that were once timbered, mostly Vance silt loam. The darker shadings represent Huntsville loam, Brenton silt loam, Proctor silt loam, and others. A few short drainageways cutting into a sandy slope underlain by slowly permeable till are shown in the southwest corner of the picture just to the south of Route 24.

(Picture supplied by
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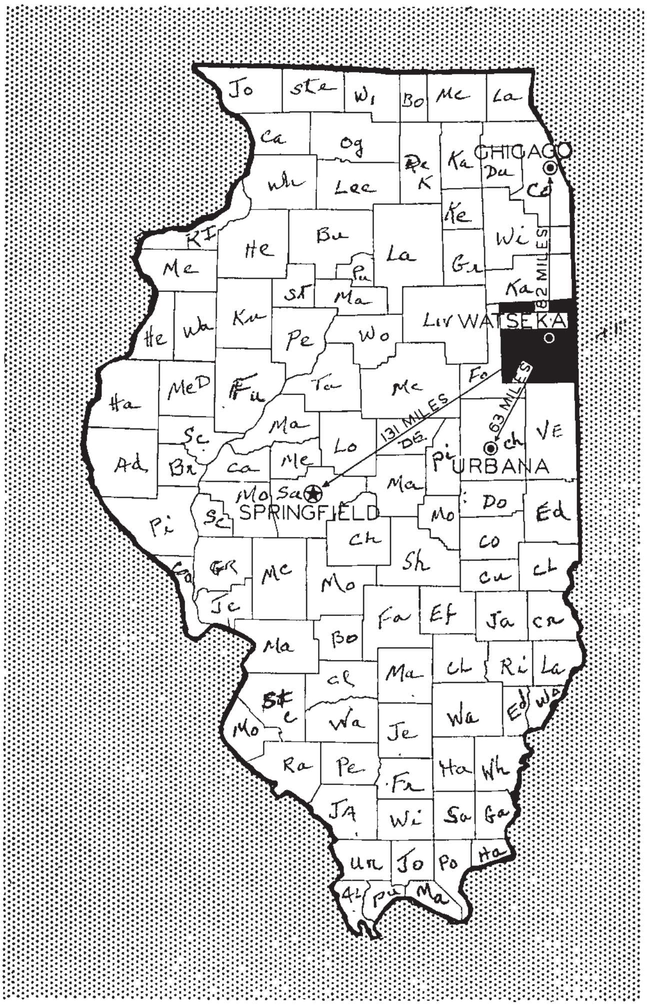

Iroquois county lies in northeastern Illinois along the Indiana state line. Watseka, the county seat, is about 63 miles northeast of Urbana, the location of the University of Illinois, and about 82 miles south of Chicago.

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The authors are indebted to other members of the staff for the following photographs: to W. F. Purnell for Figs. 4, 8, 11, and 15; to J. N. Spaeth for Fig. 7; and to B. F. Muirheid for Fig. 12.

Urbana, Illinois June, 1951

IROQUOIS COUNTY SOILS

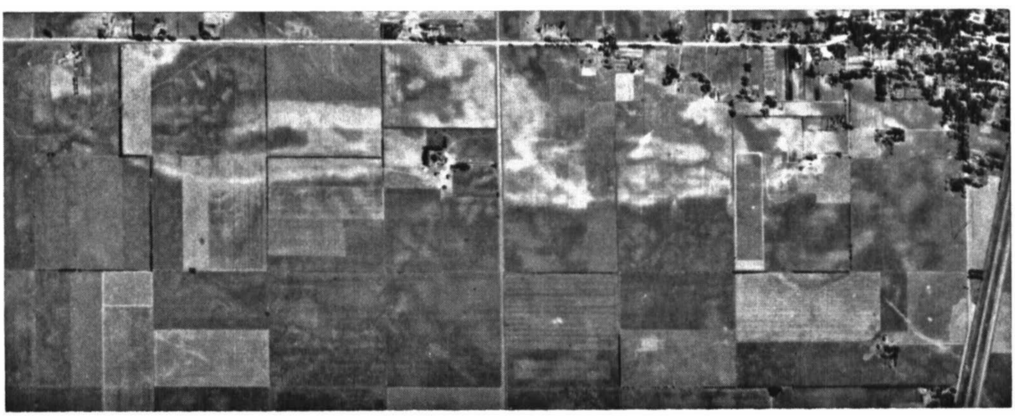
By Herman L. Wascher, R. S. Smith, and R. T. Odell

THIS SOIL REPORT has been prepared primarily for the farmers of Iroquois county. The soil map in six sections, included at the back of this booklet, shows the soils that occur in this county. Suggestions are made in the text for the use, conservation, and management of each kind of soil shown on the map.

This report attempts to answer four questions for the farmers and landowners of Iroquois county: *What soil types do I have on my farm? What treatment does each soil type need? What crops are adapted to each soil type? What yields may be expected on each soil type?*

Iroquois county is a large county and is mainly agricultural. In 1944-45 about 68 percent of the county was in cultivated crops. Sharp variation in soils within short distances is a characteristic of many parts of the county, as explained below.

Watseka, with a population of about 4,225 at the time of the 1950 Census, is the county seat and the largest town.



In many parts of Iroquois county the soils vary sharply within short distances, as shown by this aerial photograph of farmlands lying just west of Onarga. Light shading across upper half of picture is part of a sandy ridge. On this ridge the soils are loose and easy to cultivate but tend to be drouthy and are subject to wind erosion. The dark heavy-textured soils shown by dark shading in lower part of picture occur on a flat plain. They need drainage and have to be tilled carefully or they develop poor physical condition. Fig. 1

HOW TO KNOW YOUR SOILS AND PLAN THEIR MANAGEMENT

First Examine the Soil Map

Note names of soil types. The first step in using this report is to turn to the soil map and note the names of the soil types in the area in which you are interested. The map, consisting of six sheets, shows the location and boundaries of the various soil types in the county. The area of each type is shown not only by a distinguishing color but also by a number usually placed in each area. Where an area is too small to accommodate the soil number, the number is placed adjacent to the area and connected with it by a line.

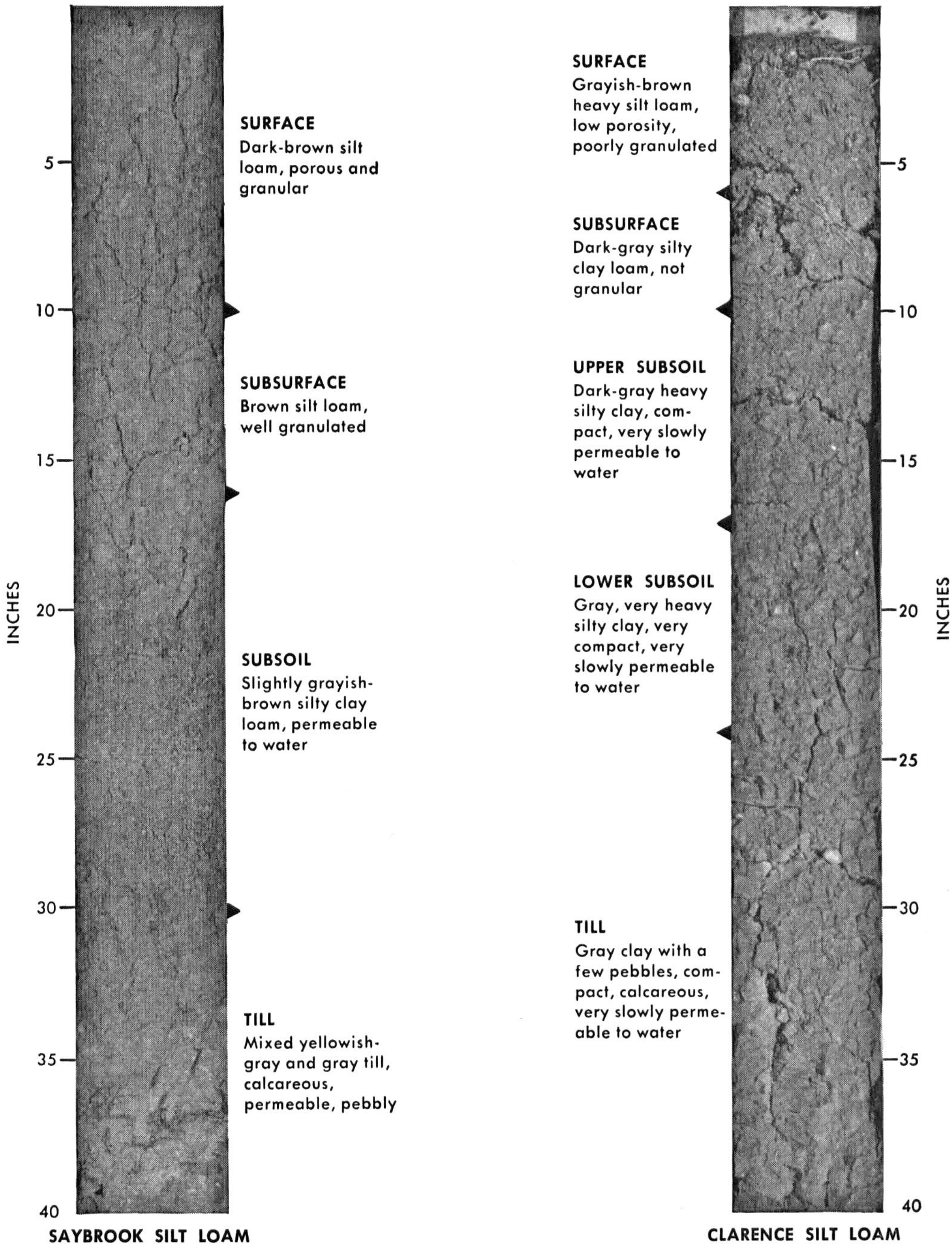
Colors are guide to general soil conditions. The most important single characteristic of the soils in Iroquois county is their permeability to water and roots, or their "tileability." Four degrees of permeability have been recognized in the dark soils that are underlain by glacial till. On the soil map, different colors are used to indicate the various degrees: shades of *blue,* for soils that are permeable to both water and roots and in which tile therefore draw freely; shades of *brown,* for soils in which tile draw moderately slowly; shades of *pink* or *light brown* for those in which tile draw so slowly as to be of questionable value; and shades of *lavender,* for those in which tile are ineffective.

Most of the light-colored soils which developed under forest vegetation are indicated by various shades of *yellow,* except Miami silt loam, which is indicated by *gray.* Many of the dark-colored soils that were derived from outwash are indicated by shades of green. Since other colors are often interspersed with the green, the color patterns of these outwash soils are not as distinct as are those for the dark-colored soils derived from till.

Study your soil types. After finding out what soil types occur on the farm or tract of land in which you are interested, turn to the soil-type descriptions (see pages 19 to 54) and read what is said about each of the soils on the tract. Some of the soils in Iroquois county are difficult to manage and medium to low in productivity; others are easily handled and high in productivity and will retain their high-producing capacity if the well-known good farming practices, including the use of limestone, fertilizers, and organic matter, are followed. The *use-and-management* discussion for each soil type and Table 7, page 56, bring out these differences in soils and suggest possible solutions for many problems.

Entire soil profile is important. In studying soil types it is important to keep in mind that soils are separated into types on the basis of the character of the soil to a depth of 40 inches or more, *not on the surface alone.* The surface layer of one type is frequently little or no different from that of another, and yet the two types may differ widely in agricultural value because of differences in the subsurface or subsoil. It is of utmost importance, therefore, in studying descriptions of soil types, to get a clear mental picture of *all* the outstanding features of each type, including the various layers to be seen as you dig down into the soil for 40 inches or more.

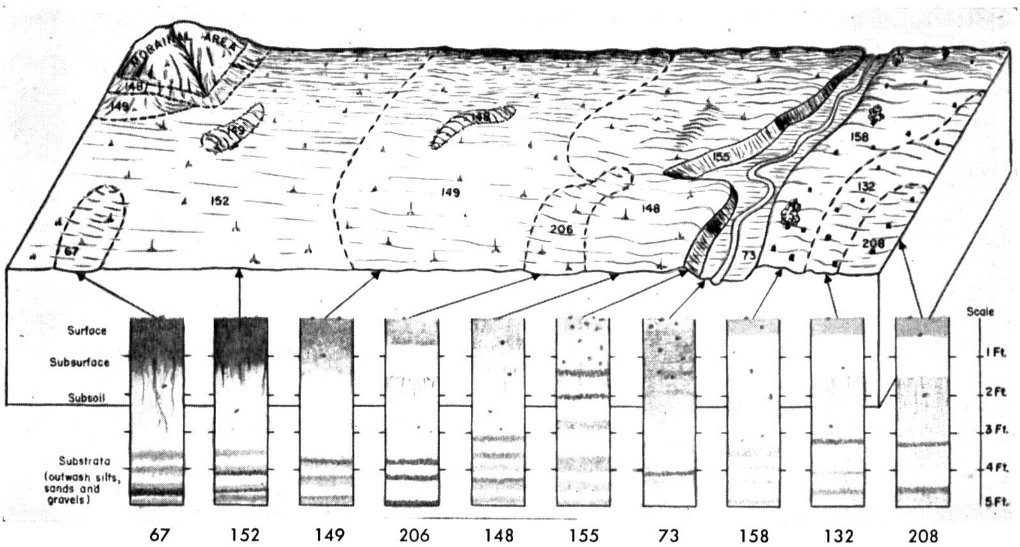
The appearance of two contrasting soils, Saybrook silt loam and Clarence silt loam, to a depth of 40 inches, is shown in Fig. 2. These two photographs show some of the differences between these two soils that strongly affect their agricultural value. In Saybrook, for example, the subsoil and underlying glacial till are permeable to water and roots.



PROFILES OF TWO SOILS SHOWING CONTRAST IN STRUCTURE

Saybrook silt loam is high in organic matter and very productive. Note dark surface horizon, granular structure, and absence of large shrinkage cracks. Because it is more permeable to water, Saybrook does not erode so rapidly as Clarence.

Clarence silt loam is only moderately productive. Note shallow, grayish surface layer, the compact structure throughout the profile, and the large shrinkage cracks indicating high clay content. Clarence erodes easily and is drouthy. Fig. 2



Type No.	Type name	Percent slope	Type No.	Type name	Percent slope
67	Harpster silty clay loam	0-1	155	Stockland loam	5-15
152	Drummer silty clay loam	0-1	73	Huntsville loam	0-1
149	Brenton silt loam	0.5-1.5	158	Vance silt loam	1-5
206	Thorp silt loam	0-1	132	Starks silt loam	0.5-1.5
148	Proctor silt loam	1-5	208	Sexton silt loam	0-1

EFFECT OF TOPOGRAPHY AND NATIVE VEGETATION ON SOIL

The upper part of the above diagram shows how six prairie soils (*left*), three timber soils (*right*), and a bottomland soil (No. 73) are located with reference to topography, or lay of the land. All are derived from waterlaid sediments. Tufts of grass indicate the areas originally covered by grasses and other prairie plants. Trees and stumps show what were once forest areas. The bottomland may have been covered with either grasses or trees or both.

The general nature of the different layers of each soil type is shown in the bottom part of the diagram. These soils are all underlain by water-deposited material varying in texture from gravel to silt or silty clay loam. This material is permeable to water. Much of it is calcareous (limey) at 4 to 5 feet. Sand grains and pebbles are often found on the surface and throughout the soil profile.

These soils differ in the amount of organic matter they contain, as shown by the shadings of the surface and subsurface horizons — the darker the shading the higher the content of organic matter. They also differ in the amount of clay in the subsoil (the greater amounts of clay are associated with the more distinct and more blocky structural aggregates). These differences, except in Huntsville, trace back to topography and depth of the water table and to the native vegetation. The material of Huntsville, a bottomland soil, has not been in place long enough to have developed a profile — its color and texture are about the same as when first laid down.

The light-colored, or timber, soils are of minor importance in Iroquois county. Starks, No. 132, and Sexton, No. 208, occupy such a small total area that they are not shown on the soil map.

Fig. 3

This soil is productive and erosion is easily controlled on it. In Clarence the subsoil and the underlying material are highly plastic, compact, and very slowly permeable. These conditions limit the productivity of this soil and make it subject to destruction by erosion.

Variations occur within each type. It is also important to understand that every soil includes a range in properties. The boundaries between soil types vary in sharpness. Between most soils there is a zone that includes some of the properties of each type. Also, within a given type there are often distinct areas of other types too small to be shown on the soil map. Sometimes types are so intermingled that it is impossible to show them separately. This intimate intermixing of soil types is illustrated by Pittwood and Iroquois fine sandy loams, which are shown on the soil map as 130-89. Similar combinations of types, of which there are five others in Iroquois county, are indicated in the legend on the soil map as "undifferentiated," and they are listed as such in Table 4.

Compare Your Yields With Test Yields

Use five-year averages. High crop yields year after year are the result of good soil and good management. Low yields may be caused by a poor soil, or by trying to grow crops not adapted to the soil, or by faulty management.

Table 1 on page 8 shows what yields can reasonably be expected from Iroquois county soils, as an average, over a period of years under a moderately high level of soil management.[1] If you find that your average yields for five years or longer are much below those shown in Table 1 for your soil types, it will pay you to examine your management practices to see where changes should be made. At least five years is necessary for a valid comparison because of the wide seasonal variations that occur in rainfall, temperature, wind, and insect and disease injury.

[1] Anyone interested in land as an investment should realize that crop yields alone are not necessarily a true index to land values, for the operating costs necessary to get good yields vary from one soil type to another. In general, the poorer the soils the more difficult and more costly it is to apply good management practices.

Still higher yields are possible. On most soils crop yields can be advanced beyond those shown in Table 1 by applying additional fertilizer containing nitrogen, phosphate, or potash, or perhaps even the minor elements. Superphosphate drilled with wheat and certain other small grains will, in many seasons, produce profitable increases in yield. There is also evidence that mixed fertilizers applied at corn-planting time often will increase corn yields, especially on very productive soils. Thus while yields below those shown in Table 1 probably indicate faulty management, higher yields than those shown are not out of the question.

Since new crop varieties, new cultural and fertilizer practices, and new plant diseases and insect pests may change yield levels in future years, the figures in Table 1 must be regarded as mainly of current interest. Later figures can be obtained from time to time by writing the Department of Agronomy, Agricultural Experiment Station, Urbana, Illinois.

Table 1. — AVERAGE YIELDS OF CROPS

To Be Expected on Iroquois County Soils Over a Period of Years Under a Moderately High Level of Management

The practices included in a *moderately high level of management* are discussed on pages 9 to 16. Figures in **bold face** are based upon long-time records kept by farmers in cooperation with the Department of Agricultural Economics; the others are estimated yields. *These yields were obtained without the use of soluble fertilizers.*

Type No.	Type name	Hybrid corn	Soy-beans	Oats	Winter wheat	Alfalfa	Mixed pasture[a]
		bu.	*bu.*	*bu.*	*bu.*	*tons*	*days*
20	Woodland fine sandy loam	47	19	36	20	2.1	100
24	Miami silt loam	57(E)[b]	23(E)	43	23	2.6	125
42	Papineau fine sandy loam	44	19	35	19	2.0	95
49	Watseka loamy fine sand	42	17	33	18	1.9	90
59	Lisbon silt loam	**72**	**28**	**52**	**26**	**3.0**	145
67	Harpster clay loam	**65**	**25**	**44**	**21**	N	120
69	Milford clay loam to clay	**66**	**27**	**47**	24	2.6	125
73	Huntsville loam, bottom	D	D	D	D	N	D
89	Iroquois fine sandy loam	46	18	33	18	1.9	90
90	Plainfield fine sand	28	11	22	12	1.2	60
91	Swygert silt loam to silty clay loam	**55**	**22**	**42**	**22**	**2.5**	115
98	Hagener loamy fine sand	41	15	31	**17**	1.9	90
101	Osceola fine sandy loam	36	16	29	14	N	70
102	LaHogue loam	**66**	**25**	45	24	2.6	125
103	Muck	V	V	N	N	N	V
106	Turtle Creek clay, bottom	D	D	D	D	N	D
130	Pittwood fine sandy loam	58	23	42	22	2.4	115
131	Alvin fine sandy loam	41	16	32	18	2.0	95
145	Saybrook silt loam	**70**	**26**	**54**	**26**	**3.0**	145
146	Elliott silt loam	**62**	**24**	**48**	**24**	**2.8**	130
147	Clarence silt loam to silty clay loam	**47**	**20**	**37**	**20**	**2.2**	100
148	Proctor silt loam	**64**	**24**	**48**	**24**	**2.8**	135
149	Brenton silt loam	**71**	**27**	**53**	**26**	**3.0**	145
151	Ridgeville fine sandy loam	56	22	44	23	2.4	115
152	Drummer clay loam	**70**	**28**	**49**	**25**	**2.8**	130
153	Pella clay loam	68	27	46	24	2.6	125
155	Proctor silt loam, rolling phase	N	N	34(E)	20(E)	2.1	100
157	Rankin sandy loam	48	20	38	21	2.2	110
158	Vance silt loam	55	22	40	23	2.4	115
189	Martinton silt loam	**65**	**26**	**50**	25	2.8	130
190	Onarga fine sandy loam	50	20	39	22	2.2	110
192	Del Rey silt loam	50	21	38	21	2.1	100
193	Elliott silt loam, rolling phase	52(E)	21(E)	41	22	2.4	115
196	Harpster fine sandy loam	V	V	V	V	V	V
204	Saybrook sandy loam	56	22	43	23	2.4	115
206	Thorp silt loam	**56**	24	**41**	22	2.0	105
221	Saybrook silt loam, rolling phase	**62**(E)	**23**(E)	**46**	23	2.6	125
223	Varna silt loam	N	N	36(E)	20(E)	2.1	105
224	Strawn silt loam	N	N	36(E)	20(E)	2.1	100
228	Eylar silt loam	39(E)	18(E)	32	19	1.9	90
229	Monee silt loam	35	18	27	17	N	80
230	Rowe clay loam to clay	**51**	**23**	**36**	**19**	**1.9**	100
231	Clarence silt loam, eroded phase	N	N	N	N	1.5	55
232	Ashkum clay loam to silty clay loam	**64**	**27**	**45**	**23**	**2.5**	120
235	Bryce clay loam to clay	**58**	**25**	**41**	**21**	**2.2**	110
238	Drummer clay	V	V	V	V	N	V
241	Eylar silt loam, eroded phase	N	N	N	N	1.4	50

[a] Estimated number of days that one acre will carry one cow.

[b] Letters have the following meanings: D = Soil fertile but yields are variable, depending upon frequency of overflow. E = Crop should not be grown unless erosion control measures are used. N = Crop not adapted. V = Variability of soil as mapped makes yield estimate impossible.

Know the Requirements of Good Soil Management

The basic requirements for getting the highest practicable yields from the various soils in Iroquois county are similar for all of them. Yet there are differences in management requirements which, if neglected, result in disappointing yields. The *use-and-management* paragraphs included in the discussion of each soil type describe these special requirements. The following discussion points out the requirements common to *all* good soil-management programs.

Good drainage is necessary. A poorly drained soil cannot be consistently productive. Those soils in Iroquois county that cannot be effectively underdrained need special attention. The problem is to recognize these soils and to provide a surface drainage system that will carry off excess water.

The same soil conditions that prevent tile from providing adequate drainage also limit root penetration. Thus these soils tend to be drouthy. Crops growing on them are sensitive to seasonal conditions and are likely to suffer during rainless periods sooner than crops on more permeable soils.

The soil map shows those areas in Iroquois county where it is hard to get effective underdrainage; and the *use-and-management* paragraphs for each soil type (pages 19 to 54) point out possible ways to lessen the harmful effects of poor underdrainage.

Tests must be made for acidity, phosphorus, and potassium. The removal of crops from the land year after year and the dissolving and leaching actions of rain finally cause soils to become acid and deficient in available plant nutrients. Satisfactory yields cannot be produced on such soils.

Soil tests are an invaluable aid in discovering nutrient deficiencies and in indicating how much limestone, phosphate, or potash to apply in order to correct the deficiencies. It often happens that parts of a field need no limestone or fertilizer, while other parts of the same field are acid and low in available phosphorus or potassium or both. The soil map and the soil tests taken together reveal these differences and make it possible to apply limestone and fertilizer where needed and in the amounts needed.

Limestone, phosphate, and potash should be applied where tests show need. As pointed out before, soil tests will show whether limestone is needed and how much, and whether available phosphorus and potassium are too low for best yields. If the soil is acid, this unfavorable condition is easily corrected by applying ground limestone. If available potassium is deficient, it can be supplied by applying a potash fertilizer.

If phosphorus is deficient, a phosphate fertilizer should be applied, but the choice of phosphate fertilizer is sometimes influenced by the type of soil. Both rock phosphate and superphosphate are widely used in Illinois. Rock phosphate costs less per ton, but to most crops except legumes it is not so readily available as is superphosphate. Under some conditions rock phosphate and superphosphate may be used interchangeably or in conjunction with each other, and under other conditions one is superior to the other. On those soils where one gives better results than the other, that fact is mentioned in the *use-and-management* discussion for each soil type.

The best information on this problem indicates that in Iroquois county there are soils that will respond well to rock phosphate and others that probably will not. What the response of some of these soils would be to superphosphate is not

known, as there is not yet enough evidence to justify conclusions. The soils that may be expected to respond satisfactorily to rock phosphate are Types 24, 59, 91, 145, 146, 147, 148, 149, 155, 158, 192, 193, 221, 223, 224, and 228. Types 91, 147, 223, and 228 would not be expected to give as good response as Type 146 (see pages 32 to 33).

On all these soils it seems good practice to apply superphosphate for wheat even though phosphate has previously been applied or the soil tests "high" in available phosphorus. Where higher yields of corn are desired on soils already in a fairly high state of productivity, the use of mixed fertilizers such as 3-12-12, 5-15-10, or 3-18-9 may be good practice. (The role and importance of phosphate are explained in Illinois Bulletin 484, "The Problem of Phosphate Fertilizers.")[1]

Organic matter must be added frequently. The maintenance of an adequate supply of nitrogen and decaying organic matter in the soil is essential. Nitrogen in large amounts is necessary for vigorous and maximum crop growth (see Table 2). Unlike phosphorus and potassium, nitrogen is not a constituent of the soil minerals — it comes largely from leguminous organic matter. It is therefore important to grow crops that, when properly managed, will leave in the soil a good supply of organic matter high in nitrogen. Nitrogen may also be purchased as a commercial fertilizer, and if judiciously applied in this form during periods of high grain prices may bring a profit.

Besides supplying nitrogen, decaying organic matter tends to keep the soil in good physical condition. Heavy-textured clays, clay loams, and silty clay loam soils are loosened up, made more "mellow" and easier to till. Light-textured fine sands, fine sandy loams, sandy loams, and loamy fine sands are bound together better, are moved less by wind action, and retain more moisture.

A good crop rotation must be used. A good rotation which includes deep-rooting legumes and fibrous-rooted grasses not only provides nitrogen and fresh organic matter but also makes it possible to maintain good physical condition in the deeper portions of the soil as well as in the surface 6 inches. These deeper parts of the soil must be kept porous enough so that water can pass down into and through them. Deep-rooting legumes help to produce and maintain this porous condition. Too often the physical condition of a soil is judged by the surface soil alone. The deeper, hidden parts of the soil are just as important as the surface in determining physical condition and sometimes more important.

Not only is it important to adopt a good rotation — it is just as important to return to the soil all crop residues and part of the top growth of the legumes. If all top growth is taken off or grazed close, much of the value of the rotation will be lost.

Another problem to be considered when selecting a rotation is the tendency of most soils to develop a "plow-sole," or compacted layer, just beneath the surface layer. This compact layer retards underdrainage and may limit the development of a good root system. Deep-rooting legumes, such as sweet clover and alfalfa, are the best remedy now known for lessening or preventing the development of this unfavorable condition.

The four-field cropping system outlined on page 11 shows a type of rota-

[1] All Illinois publications listed in this report are available at the date of the issuance of this report. When they go out of print, they are likely to be replaced by others of a similar nature. The newer publications will then be sent.

Table 2. — COMPOSITION OF NINE FARM CROPS

As Grown for the Most Part on Soil Experiment Fields Located on Dark Soils in Central and Northern Illinois

Crop		Nitrogen	Phosphorus	Potassium	Calcium	Magnesium
		lb.	*lb.*	*lb.*	*lb.*	*lb.*
Corn	Grain, 100 bushels	97	13	25	5	9
	Stalks, 4,480 pounds	38	4	67	24	18
	Cobs, 1,120 pounds	5	Trace	9	1	1
	Total	140	17	101	30	28
Oats	Grain, 50 bushels	31	4	13	2	3
	Straw, 1,700 pounds	7	1	47	6	3
	Total	38	5	60	8	6
Wheat	Grain, 25 bushels	22	4	9	1	3
	Straw, 2,000 pounds	10	1	16	4	2
	Total	32	5	25	5	5
Soybeans	Grain, 25 bushels	95	5	28	4	4
	Straw, 2,840 pounds	31	1	15	46	26
	Total	126	6	43	50	30
Alfalfa	Hay, 2,000 pounds	58	4	39	36	9
Bromegrass	Hay, 2,000 pounds	30	3	44	8	3
Red clover	Hay, 2,000 pounds	55	3	40	38	9
Soybean	Hay, 2,000 pounds	52	3	18	28	18
Timothy	Hay, 2,000 pounds	20	3	31	6	4

Analyses by H. J. Snider.

tion that has many advantages for corn-belt farms. The alfalfa-brome stays

	Field 1	Field 2	Field 3	Field 4
1951	Corn	Corn	Oats (sweet clover)	Alfalfa-brome
1952	Corn	Oats	Corn	Alfalfa-brome
1953	Oats (sweet clover)	Alfalfa-brome	Corn	Corn
1954	Corn	Alfalfa-brome	Oats	Corn
1955	Corn	Corn	Alfalfa-brome	Oats (sweet clover)
1956	Oats	Corn	Alfalfa-brome	Corn
1957	Alfalfa-brome	Oats (sweet clover)	Corn	Corn
1958	Alfalfa-brome	Corn	Corn	Oats

down two years; thus a farmer gets crops two years with one seeding. This system also provides a green-manure catch crop, sweet clover, to be plowed down for corn. Good stands and growth of catch-crop sweet clover are an essential part of this system. In order to obtain such stands, proper soil treatment and other good farming practices, including the control of insects, such as sweet-clover weevil, are necessary. On soils that should be fall-plowed (such as Types 69, 152, 153, 230, 232, and 235), the sweet clover will be hard to kill.

In this system the legumes come at times in the rotation when the nitrogen supply in the soil is lowest. The corn crops follow deep-rooting legumes and thus benefit from the nitrogen they supply.

A four-field cropping system of this kind can be fitted into various situations without sacrificing its main features. It can be adjusted to differences in soil productivity or the tendency of a soil to erode, to different types of farming, to the production of new crops, to changing

crop prices, or to hazards of weather, insects, diseases, and weeds. Crop choices and split cropping on one or more fields give the flexibility that is needed for meeting these problems.[1]

Following are seven other four-field rotations that can be used instead of the rotation of corn, corn, oats, and alfalfa-brome chosen for illustration. They show further how flexible a four-field rotation is.

Other Four-Field Rotations

1	Corn	Corn	Oats	Sod
2	Corn	Soybeans	Oats	Sod
3	Corn	Soybeans	Wheat	Sod
4	Corn	Corn-soybeans	Oats	Sod
5	Corn	Oats-soybeans	Wheat	Sod
6	Corn	Soybeans	Oats-wheat	Sod
7	Corn	Corn-soybeans	Oats-wheat	Sod

(Sod here = legumes or mixed legumes and grasses.)

In Rotations 4 to 7 the fields have been split some years to permit two different crops to be grown.

Erosion control is essential. Suggestions for reducing erosion are made on pages 19 to 54 in the paragraphs on use and management whenever a type needs such protection.

Even on moderately sloping land, the long-time effects of soil erosion must be given serious consideration, especially in those portions of Iroquois county that are underlain by slowly permeable glacial till. In those regions a thin blanket of silty material overlies the till, and it is highly important to keep this blanket of good soil-forming material. If erosion completely removes this silty material in the Clarence and the Swygert areas, the producing capacity of the soils is permanently destroyed; in the Saybrook and Elliott areas, productivity is seriously reduced.

On types with gentle slopes the right

[1] The subject of crop rotations is discussed in more detail in the U. S. Department of Agriculture Yearbook for 1938, pages 406-430, the Yearbook for 1943-1947, pages 527-536, and in the Yearbook for 1948, pages 191-202.

Farming on the contour is recommended for all slopes that have a gradient of more than 1½ to 2 feet in a hundred. Well-constructed and well-maintained terraces are sometimes needed to supplement contour cultivation. Fig. 4

rotations properly handled will cut erosion to a minimum unless so much soil has already been lost that a vigorous vegetative growth cannot be secured. Full use should be made of grass waterways, winter cover crops, contour cultivation, and other erosion-control practices. There are some areas that should be kept in permanent pasture or used for meadow. Badly eroded areas in the heavy till regions have not yet been successfully used for timber (see Fig. 14).

Detailed directions for controlling erosion will be found in Farmers' Bulletin 1795, "Conserving Corn Belt Soils," published by the U. S. Department of Agriculture, Washington, D. C., and in Illinois Circular 513, "Save the Soil with Contour Farming and Terracing."

Use good tillage practices. Soils that are to produce maximum crop yields must be kept in good physical condition. This is hard to do on any soil that is cultivated frequently — it is especially hard to do on some soils in Iroquois county.

Eight soil types (Nos. 69, 106, 152, 153, 230, 232, 235, and 238), covering 52 percent of the area of Iroquois county, have heavy-textured surfaces which are sticky when wet. If plowed when too moist, these soils dry hard and cloddy and may also develop a compacted layer, or "plow-sole." The danger of these two unfavorable conditions developing may be reduced by fall plowing. When fall-plowed, these heavy, nonerosive soils granulate during the winter, making it easier to prepare a good seedbed in the spring. Plowing these soils in the fall also lessens the danger of too much delay in preparing the seedbed in the spring.

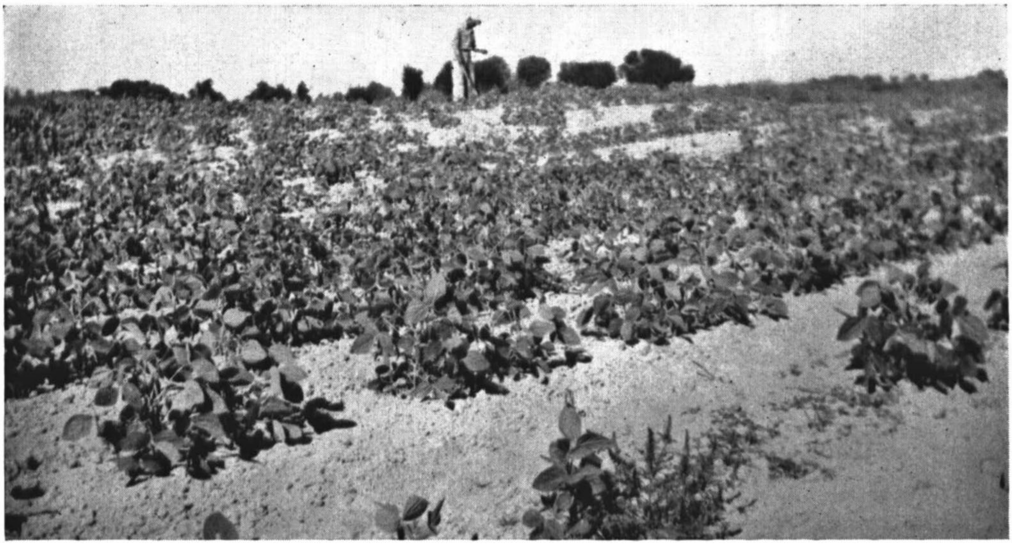
Five soil types (Nos. 91, 146, 147, 193, and 228) should not be fall-plowed. They are seriously injured by erosion resulting from improper tillage and may be permanently destroyed. Erosion is especially destructive on these five soils because it brings the unfavorable glacial till nearer to the surface. These soils should therefore be plowed on the contour and only in the spring. This precaution is especially necessary in areas with slopes of more than 2 or 3 percent. Plowing in the spring may delay planting somewhat, but the choice seems to be either this or eventual complete destruction of these soils.

Illinois Circular 604, "Shall We Fall-Plow or Spring-Plow in Northeastern Illinois," discusses this problem at greater length.

Sandy soils present special problems. There are about 73,000 acres of sandy soils in Iroquois county. Four of these soils, Nos. 49, 89, 90, and 98, are drouthy; six, Nos. 20, 42, 101, 131, 157, and 190, are somewhat drouthy; and four, Nos. 130, 151, 196, and 204, are either not drouthy or only slightly drouthy.

The *drouthy* sandy soils are not well adapted to the grain crops that grow throughout the summer but may be used for wheat or rye, the deep-rooting legumes, or timber. The *somewhat drouthy* sandy soils may be used for any of the crops grown in the region, but the chances of crop failure or partial failure are higher than on nondrouthy soils. The last group of four sandy soils — those that are *not drouthy* or *only slightly drouthy* — consistently produce good crops if well farmed with a good rotation and limed and fertilized as indicated by the soil tests.

Soil tests made to date on the sandy soils of Iroquois county show such great variation in acidity that it is necessary to test each field before liming it. Available phosphorus, on the other hand, has tested low to slight (20 to 53 pounds an acre) in all cases, and available potas-



Soybeans do not grow well on untreated areas of sandy soils, as this picture shows. Corn likewise is not a good crop unless large amounts of organic matter can be returned regularly. Alfalfa, however, does well on many of the sandy soils when properly treated. Plainfield fine sand and Hagener loamy fine sand are drouthy and are especially difficult to farm at a profit. Fig. 5

sium has tested low (less than 75 pounds an acre). These tests were made on soil samples taken from untreated fields or fence rows. Although the tests for available phosphorus and potassium indicate that these nutrients are deficient in untreated sandy soils in Iroquois county, it is desirable to test each field to determine the specific needs for soil treatment.

On the Oquawka experiment field, located on Oquawka sand in Henderson county, the untreated soils test high in available phosphorus (an average of 93 pounds an acre) and slight to medium in available potassium (an average of 108 pounds an acre). On this field rock phosphate has given no significant increases in crop yields. However, on soils testing low in available phosphorus, as many of the sandy soils in Iroquois county do, yield increases may be expected from applications of phosphate when other conditions are favorable for good crop growth.

The sandy soils in Iroquois county testing low in available potassium may be expected to respond as well to potash fertilization as the plots on the Oquawka soil experiment field, or even better. During the years 1915-1946 small but significant increases from the use of potash were obtained for all crops except rye (see Table 3). With these other crops, increases attributable to potash have gradually become larger, until in the period from 1935 to 1946 they were approximately twice as large as the long-time increases shown in Table 3.

Potash has been applied in two different carriers on the Oquawka field. Prior to 1932 kainit was used on the various series at an average yearly rate of 194 to 259 pounds an acre. Since then potassium chloride has been used, the amounts ranging from 73 to 100 pounds an acre yearly on the various series during the fifteen years to and including 1946. While the value of the increased yields of crops for the thirty-two years summarized in Table 3 has exceeded the cost

Table 3. — POTASH EXPERIMENTS

Oquawka Experiment Field in Henderson County, 1915-1946

(Located mainly on Oquawka sand)

Series No.	Average annual yields per acre in residues system										Value of increase[a]	
	WHEAT		RYE		ALFALFA		CORN		SOYBEANS		Net annual acre returns without interest[b]	Net annual acre returns with interest[c]
	RLrPK	Increase for K	RLrPK	Increase for K	RLrPK	Increase for K	RLrPK	Increase for K	RLrPK	Increase for K		
	bu.	*bu.*	*bu.*	*bu.*	*tons*	*tons*	*bu.*	*bu.*	*bu.*	*bu.*		
100.....	14.4	.1	16.9	−2 0	1.59	.22	39.1	.6	15.5	4.6	$ 25	$−.82
200.....	16.9	1.4	24.5	1.9	2.59	.04	32.2	.3	16.5	1.8	−.97	−2.33
300	20 8	1.3	18.1	1.1	2.43	.35	54.2	4.9	17 8	3.0	.68	.09
400.....	20.7	.2	14.9	−.2	1.69	.76	43.1	.6	13.1	1.7	.91	.17
500.....	16.3	2.3	21.9	2.3	2.70	.78	52.3	3.3	12.2	1.3	1.73	52
600.....	17.6	2.5	15.4	.6	1.00	−.11	45.6	4.2	9.0	.7	−.51	−1.92
Average[d]	**17.6**	**1.3****	**18.6**	**.6**	**2.00**	**.34****	**44.4**	**2.3***	**14.0**	**2.2****	**.35**	**−.72**

KEY TO SOIL TREATMENT SYMBOLS: R = residues, L = limestone, rP = rock phosphate, K = potash.

[a] Crop prices are from Illinois Cooperative Crop Reporting Service; potash is included at cost.

[b] Returns from yield increases minus cost of potash.

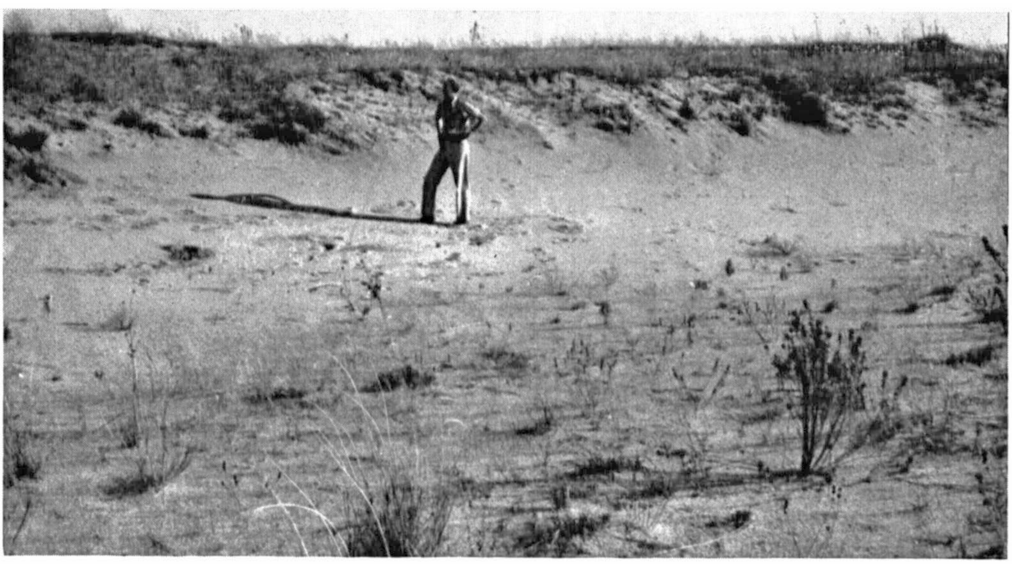
[c] Returns from yield increases minus cost of potash plus or minus interest at 4 percent earned or paid out on capital invested in potash.

[d] Tests of significance were applied only to the average crop yield increases. * Odds are more than 19 to 1 that the yield increase is not due to chance. ** Odds are more than 99 to 1 that the yield increase is not due to chance.

of the potash, potash has not produced a profit during this period as a whole if interest charges are included as part of the cost. During recent years, however, yield increases have been large enough on all crops except rye to be profitable.

On the Oquawka experiment field both manure and limestone have given large increases in crop yields. Manure should be beneficial on all of the sandy soils in Iroquois county, and limestone will be effective in increasing yields where the soils are acid.

The Indiana Agricultural Experiment Station for some years had an experiment field near Culver in Marshall



When unprotected areas of Plainfield fine sand, Hagener loamy fine sand, and other excessively sandy soils are blown by the wind, barren spots like this one are often formed. These "blow-outs" have no productive value until the soil is stabilized (see Fig. 7). Fig. 6

county, Indiana, on Plainfield fine sand. The soil materials on this field came from the same source and were laid down at the same time as most of the sandy soil materials in Iroquois county. Therefore the results from this field should apply to Plainfield fine sand in Iroquois county. In addition the Indiana experiments give some indication of the response to fertilizers that can be expected on the other sandy soils in this county.

Limestone, manure, rock phosphate, superphosphate, and mixed fertilizers in various combinations were used on the Culver field. A four-year rotation of corn, soybeans, wheat, and mixed hay was followed. The results indicate that limestone must be applied in addition to manure or other fertilizers if the best results are to be secured, although the net returns from manure plus limestone were not much higher than from manure alone. Limestone, manure, and 400 pounds of 2-12-6 fertilizer, supplemented by 16 pounds of nitrogen on the wheat, gave the highest net returns. Small increases were obtained from applications of superphosphate and rock phosphate when these materials were used in connection with limestone and manure, but the increases were no more profitable than those from the limestone-manure treatment.

The general conclusions from the Oquawka and the Culver fields seem to be that on sandy soils:

1. Manure alone gives good net increases, but when limestone is also used the returns are somewhat higher.

2. Limestone should be applied if the tests show the soil to be acid.

3. Where potassium and phosphorus are deficient, as they are in the sandy soils of Iroquois county, applications of both potash and phosphate give substantial net increases whether applied separately or in mixed fertilizer. If mixed fertilizers are used, those having a high analysis may be more economical than those with a low analysis.

4. On phosphorus-deficient soils both superphosphate and rock phosphate, when used with limestone and manure, give increases in crop yields.

5. High yields should not be expected on the poorer sandy soils regardless of treatment. Even with the treatments which gave maximum yields of the various crops on the Culver field for the period 1924 through 1938, the average yields per acre were only 36 bushels of corn, 11 bushels of soybeans, 13 bushels of wheat, and 2,153 pounds of hay. Somewhat higher average yields were obtained (1915 through 1946) on the Oquawka experiment field on the plots that received residues, limestone, rock phosphate, and potash (Table 3).

Work Out a Detailed Program

After having identified the soil types that occur on your farm, studied the recommendations for the use and management of your soils, and noted the general recommendations for good soil management, you will be able to organize your land-use and soil-management practices into an efficient program if you have not already done so. In order to study field arrangement, cropping systems, and soil treatment programs, it is often helpful to have the soil map on a large scale. A larger map for any particular farm can be easily made by following the directions given below.

First find on the colored map the section or sections in which your farm lies. Mark off this area with lines ¼ inch apart. Draw lines both across the area and up and down, beginning at the sec-

tion lines. Since the scale of the colored map is *1 inch to the mile*, the lines ¼ inch apart will represent quarter-mile lines and each quarter-inch square a 40-acre tract. Special care is required in locating tracts and drawing the cross lines for the sections in this county, since many sections are irregular in size and shape and may be either larger or smaller than regular sections.

Now, on a separate sheet of paper, draw lines that are 2 inches apart, making 2-inch squares. With the quarter-mile lines on the colored map as guides and with the outline of the farm in mind, the soil areas on the map that pertain to your farm can be drawn in the 2-inch squares. Then you will have an enlarged map of your farm, with a 2-inch square for a 40-acre tract, or a scale of *8 inches to the mile.*

The soil map can be enlarged to any other scale by following these steps and enlarging the squares proportionately.

After the soil map has been enlarged, fence lines and field boundaries can be drawn in. On most farms in Iroquois county it will be found that fence lines and field boundaries are straight lines that usually have no relation to soil types or slopes. On nearly level areas in which the various soil types have similar use-and-management requirements, straight field boundaries are an advantage, but in the more rolling parts of the county straight crop lines must be changed and be made to conform to soil types and slopes if the land is to remain permanently productive. Many fields, especially in the rolling areas, contain two or more soils that call for widely different management and cropping systems. When the area of any type is very small it often is necessary to farm this small area in the same way as the adjacent area. Often, however, the areas of the different types are large enough so that rotations can be split or boundaries of fields rearranged to allow each type to be devoted to its own best permanent use.

Usually several good field arrangements and cropping systems can be worked out for any given farm. Some farms may require two or more different cropping systems. For example, a farm that includes bottomland, rolling upland, and level upland may require three different crop rotations if these three kinds of land are to be used to best advantage. The three crop rotations must be coordinated, of course, to make an efficient cropping system for the farm as a whole.

The various points of good soil management — adequate drainage; testing for acidity, phosphorus and potassium; application of limestone and fertilizers; selection of a good crop rotation to provide organic matter and nitrogen; erosion control; and good tillage practices — should be considered carefully in developing the plan. As soon as a definite, well-coordinated crop and soil-management plan has been completed, it should be put into operation. There is no regular order, however, in which changes should be made, since conditions vary considerably from farm to farm. If drainage is not adequate, this condition must first be corrected before the best returns can be obtained from a good crop rotation and soil treatment. Also, on acid soils it is necessary to apply limestone before a good rotation, including the proper kind and acreage of deep-rooting legumes, can be adopted. On acid soils, therefore, limestone should be applied early in the soil-improvement program.

It is important to keep in touch with the latest information on cropping practices and soil treatments. Your farm adviser will be glad to help you plan a good crop and soil-management program for your farm and keep it up to date.

Table 4. — IROQUOIS COUNTY SOILS: Areas of Different Types

Type No.	Type name	Area in square miles	Area in acres	Percent of total area
20	Woodland fine sandy loam	8.11	5 188	.69
24	Miami silt loam	1.95	1 245	.16
42-49	Papineau fine sandy loam—Watseka loamy fine sand, undifferentiated	3.46	2 213	.29
59	Lisbon silt loam	8.30	5 315	.71
67	Harpster clay loam	9.68	6 198	.82
69	Milford clay loam to clay	133.26	85 285	11.34
73	Huntsville loam, bottom	18.98	12 148	1.61
89	Iroquois fine sandy loam	12.90	8 258	1.10
90	Plainfield fine sand	18.49	11 831	1.57
91	Swygert silt loam to silty clay loam	40.86	26 150	3.48
98	Hagener loamy fine sand	31.79	20 345	2.71
101	Osceola fine sandy loam	1.27	815	.11
102	LaHogue loam	56.87	36 397	4.84
103	Muck	3.35	2 144	.28
106	Turtle Creek clay, bottom	10.98	7 026	.93
130-89	Pittwood fine sandy loam—Iroquois fine sandy loam, undifferentiated	13.70	8 768	1.17
131-90	Alvin fine sandy loam—Plainfield fine sand, undifferentiated	5.55	3 552	.47
145	Saybrook silt loam	27.15	17 379	2.31
146	Elliott silt loam	60.37	38 639	5.14
147	Clarence silt loam to silty clay loam	15.79	10 108	1.34
148	Proctor silt loam	10.82	6 922	.92
149	Brenton silt loam	25.99	16 635	2.21
151-49	Ridgeville fine sandy loam—Watseka loamy fine sand, undifferentiated	72.93	46 674	6.27
152	Drummer clay loam	97.82	62 602	8.33
153	Pella clay loam	61.41	39 299	5.23
155	Proctor silt loam, rolling phase	.82	525	.07
157	Rankin sandy loam	.89	569	.08
158	Vance silt loam	10.03	6 422	.85
189	Martinton silt loam	24.60	15 742	2.09
190-98	Onarga fine sandy loam and Hagener loamy fine sand, undifferentiated	10.63	6 802	.90
192	Del Rey silt loam	10.47	6 701	.89
193	Elliott silt loam, rolling phase	7.51	4 805	.64
196	Harpster fine sandy loam	6.15	3 936	.52
204-49	Saybrook sandy loam—Watseka loamy fine sand, undifferentiated	12.27	7 850	1.04
206	Thorp silt loam	2.36	1 510	.20
221	Saybrook silt loam, rolling phase	8.61	5 514	.73
223	Varna silt loam	1.97	1 260	.17
224	Strawn silt loam	.98	630	.08
228	Eylar silt loam	3.22	2 062	.27
229	Monee silt loam	2.11	1 352	.18
230	Rowe clay loam to clay	28.21	18 051	2.40
231	Clarence silt loam, eroded phase	4.68	3 000	.40
232	Ashkum clay loam to silty clay loam	148.55	95 074	12.65
235	Bryce clay loam to clay	125.07	80 043	10.65
238	Drummer clay	9.20	5 885	.78
241	Eylar silt loam, eroded phase	3.92	2 509	.33
G.P.	Gravel pit or clay pit	.08	58	.01
	Rivers and ponds	.43	274	.04
	Total	1 174.54	751 710	100.00

SOIL TYPES OF IROQUOIS COUNTY, THEIR USE AND MANAGEMENT

In the following section, the various soil types in Iroquois county are discussed in *numerical* order, as they are listed in Table 7 on page 56. Table 7 also gives a tabulated summary of the characteristics and properties of the soils. Another numerical list is given in Table 4, which shows the area each soil occupies in the county. An *alphabetical list* is given on page 65, along with the page number within this section where each soil type is discussed.

Woodland fine sandy loam (20)

Woodland fine sandy loam is a light-colored soil found in Iroquois county chiefly along Iroquois river and south of Watseka along Sugar creek. It developed from sandy outwash sediments on nearly level to gently sloping areas once covered by deciduous forest.

Soil profile. Where it is cultivated, this soil to plow depth is a yellowish-brown fine sandy loam. It is low in organic matter and nitrogen and is medium acid. The subsurface, which is 8 to 10 inches thick, varies from a yellowish-gray fine sand to fine sandy loam. The subsoil ranges from 12 to 20 inches in thickness. It is a yellowish-gray to brownish-gray medium-plastic fine sandy clay loam. Incoherent sand or fine sand, with an occasional stratum of clay, silt, or gravel, occurs beneath the subsoil to many feet in depth. A few poorly drained depressional areas are included with this type in Iroquois county.

Use and management. Woodland fine sandy loam is not a highly productive soil. It decreases rapidly in producing capacity immediately following the clearing of the land unless precautions are taken to maintain the small amount of organic matter that has accumulated under the timber. The water-holding capacity of this soil is low, and this fact, together with the presence of open, sandy material beneath the subsoil, makes it somewhat drouthy. If the water table is lowered below the subsoil, crops suffer from lack of moisture during rainless periods of even two or three weeks.

Woodland fine sandy loam requires good management for the satisfactory production of crops. Tests for acidity should be made and enough lime applied to grow sweet clover. Then after the legume crop, satisfactory yields of grain crops may be expected if the rainfall is reasonably well distributed during the growing season. Further discussion of the management of sandy soils will be found on pages 13 to 16.

Meanings of some technical terms. In discussing soils and giving accurate descriptions of different types, some terms have to be used that may be unfamiliar to many readers of this report. The terms most likely to need explanation are defined on pages 63 and 64. We suggest a study of this list and frequent reference to it.

Miami silt loam (24)

Miami silt loam is a light-colored soil. It is derived from a thin layer of loess on calcareous glacial till which water penetrates freely. These parent materials are the same as those from which Saybrook is derived (see page 31). Miami is light colored because it developed under forest vegetation, while Saybrook is dark, having developed under grass. Miami occurs on gently to moderately sloping areas, the slopes ranging from 1½ to 3½ percent.

Soil profile. The surface horizon is a yellowish-gray silt loam 5 to 8 inches thick. It is low in organic matter and nitrogen and medium acid. The subsurface is a grayish-yellow silt loam 6 to 8 inches thick. The subsoil varies in thickness from 16 to 24 inches and is a mixed brownish-yellow, yellow, and gray medium-plastic silty clay loam. Pebbly calcareous glacial till, which water penetrates freely, lies below a depth of about 35 inches. Some pebbles usually occur throughout the profile.

Use and management. Surface drainage is good on Miami, and tile draw well on the few areas that need underdrainage. Erosion is a constant threat on this soil, but it can be controlled by good farming, including liming and fertilizing to encourage vigorous vegetative growth, a good crop rotation, and, where needed, contour farming and grass waterways. In some areas erosion has removed part or all of the silty overburden (loess), exposing the pebbly till. Such areas produce good pasture if given proper soil treatment and not overgrazed.

Although Miami does not have the reputation of being a "strong" soil, it is responsive to good management. For good management of this soil it is essential to provide for regular and frequent additions of leguminous organic matter and for plowing down — not burning — all crop residues. The soil tests should be made and, if limestone is needed, enough should be applied to provide for a good growth of legumes. If phosphorus is deficient, either rock phosphate or superphosphate will return good crop increases on this soil, judging from the results obtained on the Antioch experiment field. The returns for potash, however, are less favorable. Used with superphosphate, potash has given a very small profit at Antioch; used with rock phosphate it has shown a loss. It is not likely that applications of potash will cause much increase in yield, and they had better not be made unless soil tests show that potassium is deficient.

Papineau fine sandy loam (42)

Papineau fine sandy loam is not separated on the soil map from Watseka loamy fine sand. Papineau is a slightly better soil (see Table 1), but these two are so intermixed in some areas that a consistent separation would have required too much time to be justified. Papineau occurs chiefly east and south of Beaverville in the northeastern part of the county.

Papineau is a dark soil developed from sandy material resting on plastic calcareous glacial till or lake clay such as underlies Clarence and Swygert silt loams. It occurs on nearly level to very gently sloping areas.

Soil profile. The surface horizon is a dark-brown to brown fine sandy loam varying from 6 to about 30 inches in thickness. It is medium acid and medium in organic matter and nitrogen.

A distinguishable subsurface is not always present. Where it can be distinguished, it is a yellowish-brown to grayish-brown fine sandy loam to fine sand. Occasionally the subsoil is not distinguishable, but where present it is a grayish-brown to yellowish-gray medium-plastic fine sandy clay loam. Heavy, plastic, calcareous glacial till lies beneath the sandy overburden at varying depths, commonly below about 35 inches.

Use and management. The heavy glacial till underlying Papineau fine sandy loam interferes with underdrainage. Surface drainage also is slow on many areas of this soil. These two drainage conditions often cause this soil to be wet in spring. The underlying heavy material, which restricts root penetration and the movement of moisture, also makes this soil somewhat drouthy in summer.

This soil should be tested for acidity, available phosphorus, and potassium and treated as the tests indicate. A good rotation which provides for the frequent addition of leguminous organic matter is essential. It is good practice to use this soil for pasture, seeding a mixture of the clovers, alfalfa, and bromegrass or timothy. Papineau is not a very good corn soil but produces satisfactory yields when well farmed and the rainfall is well distributed through the growing season. Rye, wheat, and soybeans are better adapted to this soil than corn. It may also be used to advantage for truck crops and melons.

For further discussion of the management of sandy soils, turn to pages 13 to 16.

Watseka loamy fine sand (49)

Watseka loamy fine sand is a dark prairie soil derived from coarse outwash sediments. It occurs on nearly level to very gently sloping areas. This soil is so intimately mixed with Papineau and Ridgeville fine sandy loams and Saybrook sandy loam that it is not shown separately from these types on the soil map.

Soil profile. The surface horizon is a brown to dark-brown loamy fine sand varying in depth from 6 to about 20 inches. Beneath this dark surface the material is a grayish-brown, gray, or yellowish-gray fine sand to an undetermined depth. No identifiable subsoil is present.

Use and management. The water-holding capacity of Watseka loamy fine sand is low because, as noted above, it has no clay accumulation in the subsoil. So long as the water table is high, this soil is not drouthy, but there is danger of drouth if the water table is lowered below about 3 feet. The chief difficulty in managing Watseka loamy fine sand is its drouthiness. Little can be done to overcome this handicap other than to grow early maturing crops and deep-rooting legumes.

If this soil is to be cropped, the tests for acidity, phosphorus, and potassium should be made, and liming and fertilizing programs should be adopted that will correct any deficiencies shown by the tests. An open sandy soil like Watseka leaches so readily that a reserve supply of nitrogen and decomposible organic matter cannot be built up. In order to maintain a good supply of nitrogen in this soil, it therefore becomes necessary to add organic matter more frequently than on a heavier soil.

The management of sandy soils is discussed further on pages 13 to 16.

Lisbon silt loam (59)

Lisbon silt loam is a dark soil formed from thin loess or silty wash on permeable calcareous glacial till. It developed under tall-grass vegetation on very gently sloping land, chiefly in the east-central part of the county. Lisbon is one of the best soils in Iroquois county.

Soil profile. The surface horizon of this type is a brown to dark-brown heavy silt loam 7 to 10 inches thick. It is high in organic matter and nitrogen and slightly acid to neutral in reaction. The subsurface is a brown to dark grayish-brown silt loam. The subsoil, which begins at a depth of 15 or 16 inches, is a mottled yellowish-brown to brownish-gray medium-plastic silty clay loam. A few inches of silty or sandy material often lies immediately beneath the subsoil; and calcareous glacial till, permeable to water, generally begins at a depth of 35 to 40 inches. Some areas of Lisbon to the north and south of Sheldon are calcareous at depths as shallow as 20 to 25 inches.

Use and management. Lisbon silt loam is a productive soil, easy to cultivate, and not subject to erosion except where water from adjacent higher land flows across it. Surface drainage is fairly good on most areas, and tile draw well. This soil, like all soils that are somewhat heavy, tends to form a compacted layer, or plow sole, just beneath the surface soil unless deep-rooting legumes are grown. Such a layer will retard underdrainage and discourage root penetration.

Although Lisbon is well supplied with plant nutrients, intensive farming will reduce the amounts which are readily available. Soil tests should therefore be made to determine whether Lisbon needs limestone to grow good clover or alfalfa, and whether it is deficient in available phosphorus and potassium. Though no experimental plots are located on this type, it is believed that crops will respond to phosphate where tests show the soil to be low in phosphorus. Where wheat is grown, it probably will be worth while to apply superphosphate. If very high yields of corn are desired, or if only small deficiencies of available phosphorus and potassium exist, a mixed fertilizer, such as 3-12-12 or 3-18-9, is suggested when a good crop rotation and other good farming practices are followed.

Harpster clay loam (67)

Harpster clay loam is a dark, heavy soil which occurs on nearly level and depressional areas. It is found in association with a number of other soils but principally with Drummer clay loam. It was developed from wind- and water-deposited sediments which often rest on glacial till at a depth of about 40 inches. Harpster was formed under swampy conditions, and the heavy growth of marsh vegetation added large amounts of organic matter. Its alkaline condition is due to the accumulation of disintegrated shells of fresh-water snails that lived on these grasses. This alkaline condition is the outstanding feature of Harpster.

Soil profile. The surface horizon of Harpster is a black to grayish-black clay loam to silty clay loam varying from 5 to 12 inches in thickness. It is high in organic matter and is alkaline. The grayish cast often observed in this soil is due in part to the many snail-shell fragments present. The subsurface

is sometimes indistinguishable. It is usually a very dark-gray or grayish-black clay loam. At 14 to 18 inches it grades into the subsoil, a medium-plastic clay loam to silty clay loam that is dark gray spotted with yellow. Lime concretions and fragments of snail shells occur throughout the profile.

Use and management. The chief problems in the management of Harpster are drainage and correction of the potassium deficiency. It often is not practical to use furrows and ditches for draining Harpster because of its low-lying position. Tile draw well, and the only difficulty in installing a tiling system is to get satisfactory outlets.

This soil is not well adapted to the small grains, as they tend to lodge, but it is a good corn soil after any potassium deficiency has been corrected by the use of such materials as muriate of potash or coarse strawy manure. The use of potash will probably also lessen the tendency of small grains to lodge.

It is advisable also to apply phosphate on this soil. If phosphate is applied separately, it should be in the form of superphosphate rather than rock phosphate. Rock phosphate is not effective on an alkaline soil such as Harpster.

Another method of correcting the deficiencies of both phosphorus and potassium is to apply a mixed fertilizer high in potash, such as 0-10-20 or 0-9-27. As this soil is naturally too alkaline, no limestone should be applied.

Unless good farming practices are followed, there is a tendency for a heavy soil like Harpster to gradually become less permeable to water and therefore more difficult to underdrain. To lessen this danger it is advisable to include in the rotation deep-rooting legumes such as sweet clover. Also, care should be taken not to plow or otherwise till this soil when it is too moist. The decision when to plow should be determined by the condition of the subsurface as well as the surface, for it often happens that even after the surface horizon has dried enough to be tilled, the subsurface remains wet and therefore is easily compacted.

Milford clay loam to clay (69)

Milford clay loam to clay is a dark soil derived from fine-textured sediments. It occurs on nearly level areas and has developed under heavy marsh-grass vegetation. It is a very extensive soil in Iroquois county.

Soil profile. The surface horizon, which extends to a depth of 12 to 18 inches, is a dark grayish-black or black clay loam or silty clay loam to clay. It is high in organic matter and nitrogen and neutral to slightly acid. The subsurface is hard to distinguish from the surface soil but usually is dark gray rather than black. The subsoil, usually found between depths of 20 and 35 inches, is a dark-gray or dull yellowish-gray plastic clay with yellow spots. The underlying materials are heavy calcareous lake sediments, sometimes with thin sandy layers.

Use and management. Milford clay loam to clay is a productive soil. It is well supplied with organic matter and the plant-food elements except on areas that have been heavily cropped and poorly farmed. It commonly needs no limestone, yet it is advisable to test it for acidity as well as for available phosphorus and potassium.

Drainage often is a problem on this soil. Surface drainage is slow and underdrainage is somewhat slow, although tile draw well enough to be effective. It is advisable to fall-plow Milford, as the

freezing and thawing that occur during the winter will improve the physical condition of the plowed layer. When plowing is delayed until spring, the soil often remains wet too long to permit the seedbed to be prepared for planting at the proper time.

Observations indicate that, with continued farming, underdrainage in a soil like Milford gradually becomes slower unless deep-rooting plants are grown in the rotation and care is taken not to work the soil when either the surface or subsurface is too moist. The increasingly slower underdrainage is caused by compaction in the subsurface. The development of this unfavorable condition is much easier to prevent than to cure. Deep tillage will open up a compacted subsurface, but deep tillage is expensive and no one knows how long its effects will last. The best solution is to use a good rotation that includes a mixture of deep-rooting legumes and fibrous-rooted grasses, and to work the soil only when moisture conditions are right.

Huntsville loam, bottom (73)

Huntsville loam is a dark soil derived from sediments deposited by streams. It occurs along Iroquois river and Sugar creek and most of their tributaries except Spring, Mud, and Pigeon creeks.

Soil profile. Huntsville has no definite profile development. The surface layer is variable but is usually a dark-brown or dark grayish-brown mixed sandy loam to silty clay loam. It ranges from moderately high to high in organic matter and nitrogen and usually is neutral or only slightly acid. The materials beneath the surface layer are variable in texture and color. The darker shades, however, predominate, and rusty-brown splotches usually are present below a depth of about 25 inches.

In many places along Iroquois river the flood plain has no distinct boundary. East of Watseka the true bottom is very narrow and is bordered by low terraces which are 1 to 6 feet above the narrow bottom. These low terraces are shown on the soil map chiefly as Brenton and Proctor silt loams. They frequently are covered by high flood water, show no profile development and are hard to distinguish from the bottom. The surface soils of many of these low terraces are alkaline.

Use and management. Many of the bottoms in Iroquois county are narrow and irregular and not well suited to cultivation. It is common practice to use such bottoms for pasture, and this is considered their best use. The wider bottoms are suitable for cultivation but are subject to flooding. Local experience must be depended on to decide whether such bottoms should be cropped.

No soil treatment is advised for Huntsville because of frequent overflow.

Iroquois fine sandy loam (89)[1]

Iroquois fine sandy loam is a dark soil derived from sandy outwash sediments. It occurs chiefly in the northeastern corner of the county and occupies nearly level to slightly depressional areas which were once covered by marsh or wet prairie vegetation. In other places this soil is intimately associated with Pitt-

[1] Subsequent to the preparation of the Iroquois county soil map the name Iroquois fine sandy loam was changed to Maumee fine sandy loam.

wood fine sandy loam, and the two are shown together on the map as Number 130-89.

Soil profile. The surface horizon of Iroquois is a dark-brown or black fine sandy loam varying in thickness from 6 or 8 inches to as much as 20 inches. In uncultivated areas the surface horizon is medium high in organic matter and medium to slightly acid. The material beneath the surface soil is yellowish-gray or gray sand or fine sand. There is slight subsoil development, with little or no accumulation of clay. Below a depth of 3 or 4 feet, layers of coarse sand and gravel are common, and thin layers of silt and clay may be present.

Use and management. The water-holding capacity of Iroquois fine sandy loam is low because no clay has accumulated in the subsoil. This type was developed under a high water table, and a moderately high water table should be maintained or drouthy conditions will be increased. It is very easy to ruin a soil such as Iroquois fine sandy loam by lowering the water table too much.

This soil often is wet in the spring. This condition may be remedied by using dredge ditches that can be closed before too much water is removed. A series of open furrows for surface drainage is probably preferable to a tiling system.

Much of Iroquois is used for pasture and this is probably its best use. If it is cultivated, the management practices recommended for Watseka loamy fine sand (page 21) should be followed.

Plainfield fine sand (90)

Plainfield fine sand is a light-colored soil derived from sandy sediments. It usually occurs on gentle slopes, but in Iroquois county some areas of the type are strongly sloping. Plainfield occurs, for the most part, in Beaverville, Middleport, and Belmont townships. Blowouts are common in Plainfield fine sand.

Soil profile. In most of the areas the surface horizon is a yellowish-gray fine sand 2 to 5 inches thick. It is acid and low in nitrogen and organic matter. Beneath the thin surface layer the material is yellow sand with no subsoil accumulation of clay. In dry roadside cuts where the soil profile is exposed, a slight cementation can be seen at a depth of 2 or 3 feet. On nearly level areas with a moderately shallow water table some gray and rusty-brown spots or mottlings can be seen at these same depths.

Use and management. Plainfield fine sand is drouthy. Deep-rooting plants, such as alfalfa and sweet clover, and early-maturing crops, such as rye, suffer less from drouth than other crops. No attempt should be made to grow corn on this soil.

Probably the best use for Plainfield fine sand is for the growing of timber. According to the University of Illinois Department of Forestry, this soil is adapted to certain of the pines. They rapidly develop a protective cover when planted on old fields and pastures. Red pine, white pine, jack pine, and Scotch pine produce good Christmas trees in five to nine years and fence posts in twelve to fifteen years. White pine and red pine will produce at least 1,000 board feet of lumber an acre each year and are recommended by the Forestry Department for lumber production. These species will produce small saw logs in about thirty years and mature trees in sixty to seventy years, as Fig. 7 on the next page shows.

For more information on managing sandy soils see pages 13 to 16.

A forty-year-old eastern white pine plantation on Plainfield sand. During the last five years the lumber volume of this stand increased each year at the rate of 1,385 board feet an acre. Fig. 7

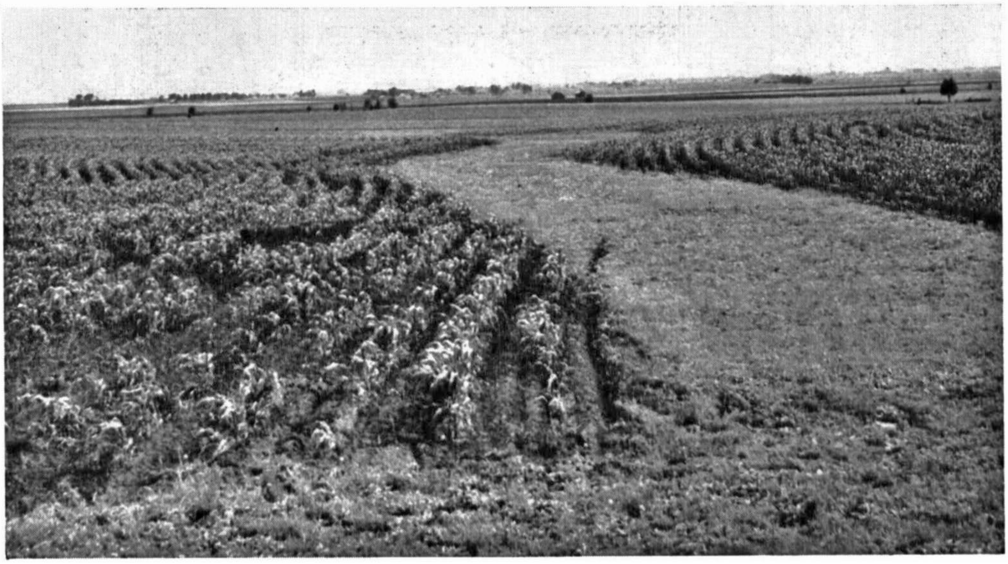
Swygert silt loam to silty clay loam (91)

Swygert silt loam to silty clay loam is a dark soil formed from thin silty wind-deposited loess on compact and plastic calcareous glacial till. It occurs on gently sloping to moderately sloping areas and occupies a total of about 26,000 acres in Iroquois county.

Soil profile. The surface horizon of this type is a brown to dark-brown heavy silt loam. Where not eroded, it is 7 to 10 inches thick. It is medium in organic matter and nitrogen and medium to slightly acid. The subsurface is a yellowish-brown heavy silt loam to silty clay loam. The subsoil, which begins at a depth of 12 to 15 inches, is a mottled brownish-gray plastic silty clay loam to silty clay. Heavy, plastic, calcareous (limey) till lies beneath the subsoil and extends to an unmeasured depth.

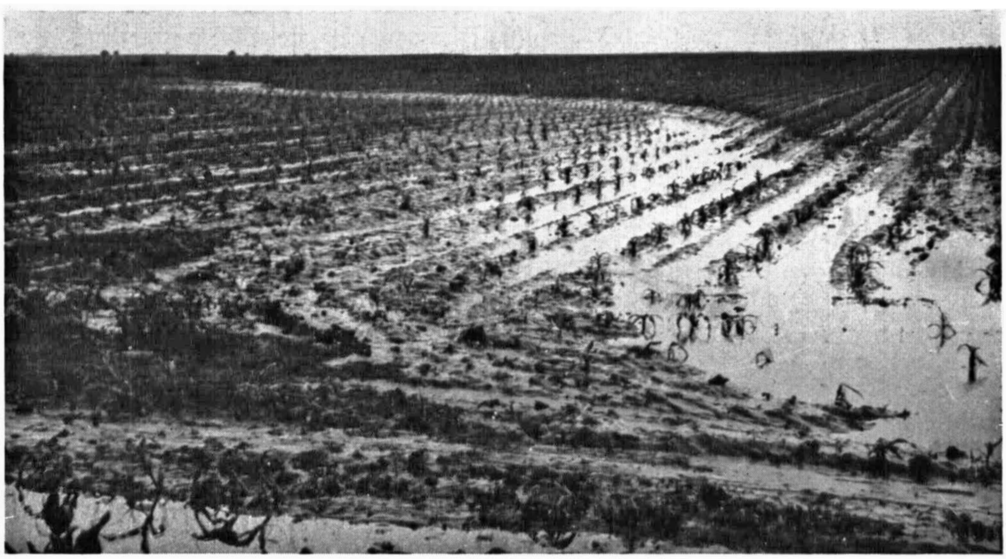
Use and management. The surface drainage of Swygert silt loam to silty clay loam is moderate to rapid, but underdrainage is slow. During heavy rains this slow underdrainage causes excessive runoff, which may in turn cause severe erosion. Areas that have been eroded down to the heavy, plastic subsoil or underlying till are extremely difficult to cultivate and are unproductive. It is therefore important to reduce to a minimum the loss of surface soil by erosion. Each field must be studied to determine the best management for it in order to get best results.

Well-planned and well-maintained



Slow underdrainage on Swygert silt loam calls for special measures to retard the flow of excess surface runoff. Grass waterways are important, as also is contour cultivation on land that slopes more than 1½ to 2 feet in a hundred. Fig. 8

grass waterways are important for reducing erosion. All areas that slope more than 1 to 2 percent should, if possible, be tilled on the contour. In cornfields another good way to reduce erosion during the late fall, winter, and spring is to roll down the stalks at right angles to the slope. The value of terracing on this soil is questionable, unless the terrace ridges are always inspected for cracks



Here is a field of Swygert silt loam being ruined by up-and-down cultivation and unsodded waterways. Fields like this rapidly lose their productive surface layer of silt loam, cultivation becomes difficult, and crop yields are seriously decreased. Fig. 9

following dry periods. Cracks are likely to form across the terrace ridges because the soil is high in very fine particles which expand when wet and contract when dry. These cracks should be filled with soil material; otherwise they are likely to allow break-throughs in the ridges during heavy rains.

The owners and operators of farms on Swygert should realize that injury of this soil by erosion is permanent and often rapid. Crops should be so managed that a legume-grass sod occupies this soil one or more years out of every four. All crop residues should be turned under. All available manure should be carefully preserved and used where most needed.

Thorough soil tests should be made in order to have a good basis for the liming and fertilizing program. This soil type will most likely respond to fertilizers in the same way as Elliott silt loam (see pages 32 to 33). Yields will be somewhat less than on Elliott (see Table 1, page 8), but the response to phosphate and potash should be similar. Results from the Joliet field (Table 5, page 34) are of interest to one farming this soil.

Hagener loamy fine sand (98)

Hagener loamy fine sand is variable, particularly in the depth of the surface soil. It occurs mostly on gentle slopes, but in Iroquois county, in order to simplify the map, a similar soil occurring on stronger slopes was included with Hagener. Many areas of Hagener are found in the central and northeastern parts of the county in association with other sandy types. Blowouts are common, especially on the dunelike ridges, and drifting has to be guarded against when this soil is cultivated.

Soil profile. The surface horizon is a brown to light-brown loamy fine sand. It varies in thickness from 6 or 8 inches to as much as 30 or 40 inches. It is medium low in organic matter and nitrogen and medium acid. Beneath the surface horizon the material is a brownish-yellow to yellow fine sand. There is no accumulation of clay in the upper 40 inches of the soil profile. Water-deposited layers of clay and silt occur in many places at a depth of 4 or 5 feet.

Use and management. The water-holding capacity of Hagener loamy fine sand is low because clay, which helps to hold water, has not accumulated in the upper 40 inches of the soil profile. However, when the rainfall is well distributed this soil responds well to fertilization and good farming. Many of the more sloping areas included in this type are in permanent pasture. Probably their best use is for pasture or timber. For a discussion of species of timber to use on Hagener see Plainfield fine sand, page 25.

Wheat and rye, particularly rye, are better adapted to this soil than corn, and they give some protection against the drifting of the soil in early spring.

Further management suggestions for sandy soils are given on pages 13 to 16.

Osceola fine sandy loam (101)[1]

Osceola fine sandy loam is a medium-dark soil formed from sandy outwash sediments. It is found in small, scattered areas that are nearly level or depressional. The wet spots in fields of sandy soil are often Osceola. This soil is unimportant from the standpoint of total

[1] After the preparation of the Iroquois county soil map the name Osceola fine sandy loam was changed to Milroy fine sandy loam.

acreage, as it occupies only 775 acres in Iroquois county.

Soil profile. The surface horizon is a grayish-brown fine sandy loam 6 to 8 inches thick. It is medium low in organic matter and nitrogen and medium to strongly acid. The subsurface is a gray to yellowish-gray fine sandy loam varying from 5 to 15 inches thick. The subsoil is a dark-gray to pale yellowish-gray plastic fine sandy clay. Below a depth of about 35 or 40 inches are layers of water-deposited sands and silts.

Use and management. The chief problem in farming Osceola is the difficulty of draining it. Tile do not draw satisfactorily because the subsoil is very slowly permeable. Also the areas are usually low-lying and far from drainage outlets. Thus the removal of excess water either through tile or by means of ditches is often difficult.

To treat each spot of Osceola is a problem in itself. No general suggestions for the management of these spots can be made other than first to make provision for drainage, if that is possible; then test each spot and apply the treatments needed; then farm the spots as nearly as possible the way the rest of the field is farmed.

LaHogue loam (102)

LaHogue loam is a dark soil formed from mixed outwash sediments and occurs on nearly level or very gently sloping areas. It is an important soil in Iroquois county, occurring extensively northwest of the town of Onarga and in smaller areas elsewhere in the county.

Soil profile. The surface horizon is a brown or very dark grayish-brown fine sandy silt loam or fine sandy clay loam. It is 6 to 10 inches thick, medium to high in organic matter and nitrogen, and medium to slightly acid. The subsurface is a brown to grayish-brown fine sandy silt loam or fine sandy clay loam 6 to 8 inches thick. The subsoil is a yellowish-gray to brownish-gray moderately plastic fine sandy clay loam with yellow spots. Below a depth of about 35 inches the material is stratified sand and silt and often calcareous at 45 inches. LaHogue may be thought of as having characteristics intermediate between Ridgeville fine sandy loam and Drummer clay loam; in some areas it occurs as a transition belt between these two types.

Use and management. LaHogue loam is a productive, durable soil. It needs to be drained, and tile draw freely. The only difficulties in getting effective drainage are in getting enough fall for the tile lines and in obtaining good outlets.

A good rotation should be adopted and soil tests should be made. There are some alkaline spots in LaHogue, and these spots frequently need potash fertilizer. This soil will remain productive indefinitely with good farming that includes good tillage, effective drainage, adequate provision for fresh leguminous organic matter, and soil testing followed by such fertilization as the tests indicate is needed.

Muck (103)

Muck is of minor importance in Iroquois county, having a total area of only about 2,000 acres. It has developed in poorly drained swampy flats or basinlike depressions where the water table was once high throughout the year.

Soil profile. No profile development has taken place in this type. The surface material, which varies in thickness from a few inches to several feet, consists primarily of well-rotted plant remains or other organic matter, with varying amounts of silt and clay. It is black, neutral or alkaline in reaction, and low in available potassium. The underlying material is often calcareous and marl-like.

Use and management. On many areas of Muck, surface drainage is slow, but underdrainage is good if an outlet is available.

Undrained areas are best used for permanent pasture. Drained areas that are fertilized with potash are adapted to truck crops, hay, and corn. The small grains, soybeans, and clovers, however, grow so rank that they frequently lodge. This difficulty may be partly overcome by applying a phosphate-potash fertilizer such as 0-9-27 or 0-10-20.

Turtle Creek clay, bottom (106)

Turtle Creek clay is a dark soil formed from heavy alluvial sediments. It occurs along Spring, Mud, and Pigeon creeks, whose watersheds are mainly in the heavy calcareous till and lake-clay regions of the county.

No profile development has taken place in this soil. The material is a dark grayish-brown to dark-gray heavy clay many feet in depth. Occasionally there are thin layers of silt and fine sand which were deposited by running water.

Use and management. Turtle Creek clay is well supplied with the plant nutrients. It is difficult to cultivate and is subject to overflow. During favorable seasons it produces good crops of corn and soybeans, but the best use for most areas of this soil probably is pasture.

Pittwood fine sandy loam (130)

Pittwood fine sandy loam is a dark soil formed from sandy sediments. It occurs on nearly level to slightly depressional areas and is found principally north of Watseka in the vicinity of Pittwood. It usually is closely associated with Iroquois fine sandy loam and the two are shown together on the soil map as Number 130-89.

Soil profile. The surface horizon of Pittwood is a dark-brown to black fine sandy loam. It varies in depth from about 6 to 20 inches and is high in organic matter and nitrogen and neutral to slightly acid. A subsurface horizon is not always present, but when present it is a dark-gray to pale yellowish-gray loamy fine sand. This horizon varies in thickness from 0 to 10 inches. The subsoil is dark gray spotted with yellow. It is a moderately plastic fine sandy clay loam 10 to 20 inches thick. Below a depth of about 35 inches the material is a gray fine sand with occasional layers of silt and clay.

Use and management. The clay in the subsoil of Pittwood increases its water-holding capacity so that it is not as drouthy as Iroquois fine sandy loam, with which it is associated. When this soil is drained, farmed to a good rotation, and so treated as to correct any shortages indicated by the soil tests, it produces good yields of the crops common to the region.

For further discussion of the management of sandy soils see pages 13 to 16.

Alvin fine sandy loam (131)

Alvin fine sandy loam is a light-colored soil occurring on gentle slopes. It is not an extensive soil in Iroquois county; most of it is found along Iroquois river.

Soil profile. The surface horizon is grayish-yellow fine sandy loam, low in organic matter and nitrogen and medium to strongly acid. It varies from 3 to 6 inches deep. The subsurface is a loose yellow loamy fine sand or fine sandy loam that in cultivated areas is hard to distinguish from the surface. The subsoil, which begins at a depth of 16 to 20 inches, is a yellow to brownish-yellow slightly plastic sandy clay loam. The underlying material is commonly a mixture of sand and fine sand, sometimes with thin layers of silt, clay, or gravel.

Use and management. Alvin fine sandy loam has both good underdrainage and good surface drainage. It is somewhat drouthy for corn and soybeans and is subject to wind erosion. Although not naturally productive, Alvin fine sandy loam gives satisfactory yields during seasons of favorable moisture provided the soil has been properly treated and a good rotation used.

Next to its low water-holding capacity, the most serious limitation of Alvin fine sandy loam is its deficiency of organic matter and nitrogen. A reserve supply of these materials cannot be built up because of the leachy nature of this soil, and fresh organic matter must therefore be returned at frequent intervals.

Further discussion of the use and management of sandy soils will be found on pages 13 to 16.

Saybrook silt loam (145)

Saybrook silt loam is a dark soil. It has developed under prairie vegetation from a thin blanket of loess, on calcareous glacial till into which water penetrates readily. It is found on gently sloping to moderately sloping topography. Where the slope becomes less than about 1 percent, Saybrook grades into Lisbon silt loam. The total area of Saybrook in Iroquois county is a little over 17,000 acres.

Soil profile. The surface horizon of Saybrook is a brown to dark-brown silt loam 6 to 10 inches thick. It is medium high in organic matter and nitrogen and medium acid. The subsurface is a light-brown to yellowish-brown silt loam. The subsoil, which begins at a depth of 14 to 16 inches, is a brownish-yellow moderately plastic silty clay loam to clay loam 16 to 22 inches thick. There are usually a few inches of leached till in the lower part of the subsoil. At a depth of 35 to 40 inches this leached material grades into friable calcareous glacial till.

Use and management. Saybrook silt loam is a productive soil that is easy to work. On the more sloping portions of the type there is much erosion. The loss of the silty material that overlies the till reduces the productivity of this soil, but the effect is not so serious as similar loss on the heavy till types. Contour tillage, grass waterways, and a good rotation should, nevertheless, be used to reduce the amount of erosion. Saybrook is well adapted to terracing, and on some areas a well-designed and well-maintained terrace system is advisable.

Vigorous plant growth is necessary for a successful erosion-control program. Soil tests should therefore be made and limestone, phosphate, and potash applied if need for them is indicated.

There is no experiment field located on Saybrook, but it is reasonable to suppose that if tests show a shortage of phosphorus and if a good rotation is used, this soil will respond to phosphate fertilizer. Either rock phosphate or superphosphate may be used. The response to phosphate will be less in a manure or livestock system of farming than in a residues or grain system.

Saybrook is not likely to be low in potassium. Each field should be tested, however, and if there is a shortage of this element, potash must be applied in order to get maximum yields. If the soil is deficient in both phosphorus and potassium, these elements may be supplied in a mixed fertilizer such as 0-12-12 or 0-20-10, or separately as muriate of potash and either rock phosphate or superphosphate.

Saybrook should not be plowed in the fall, especially on areas that slope more than about 2 percent. Such areas should be protected as much as possible against erosion during the fall, winter, and spring by crop residues and cover crops.

Further information about the use of potash and phosphate will be found in connection with Elliott silt loam (see below). While Saybrook differs from Elliott in several ways, its response to fertilizers would likely be similar.

Elliott silt loam (146)

Elliott silt loam is an important soil in Iroquois county. It is a dark soil and was formed under grass from thin loess on compact calcareous glacial till through which water penetrates moderately slowly. It occurs on gently sloping to moderately sloping areas. Surface drainage is moderate to rapid, whereas underdrainage is moderately slow. The subsoil and underlying glacial till, in their plasticity and permeability to water, are intermediate between Saybrook silt loam and Swygert silt loam to silty clay loam.

Soil profile. The surface horizon of Elliott is a dark-brown heavy silt loam 6 to 10 inches thick. It is medium in organic matter and slightly to medium acid. The subsurface is a brown to light-brown silt loam 4 to 6 inches thick. The subsoil, which begins at a depth of 14 to 16 inches, is a mixed brownish-gray and yellowish-gray medium-plastic silty clay loam. Below a depth of 30 to 35 inches there is compact calcareous glacial till.

Use and management. Good soil management for Elliott silt loam must provide for four things: (1) the control of erosion, (2) the correction of soil acidity, (3) the maintenance of enough nitrogen and organic matter for good crop growth, and (4) additions of phosphate and potash in amounts shown by the soil tests to be needed.

Except where areas slope more than about 2 percent, erosion can be controlled satisfactorily in general farming by using good farming methods. Such methods include the soil treatment necessary to obtain good crop growth, contour farming and grass waterways, and protection of slopes by leaving crop residues on the surface to slow down the rate of runoff during fall, winter, and spring. More water can then penetrate into and be absorbed by the soil; thus less will run off, and erosion will be correspondingly reduced. Rolling down the cornstalks at right angles to the slope, if the picker has not already left them well flattened, is effective in reducing erosion. Areas that slope more than 2

percent need, besides the good farming methods mentioned above, longer crop rotations, with more sod crops and winter cover crops. Fall plowing should be avoided on Elliott silt loam as much as possible, but when it is necessary it should be done on the contour and the land left rough.

After limestone applications based on acidity tests have corrected soil acidity, a good rotation including legume catch crops and standover legumes should be adopted.

Strongly sloping areas of Elliott are subject to severe and permanent damage by erosion. These areas are therefore better adapted to livestock farming than to grain farming.

Experience with the Joliet soil experiment field, which is located on a soil intermediate in properties between Elliott silt loam and Swygert silt loam to silty clay loam, may be taken as a guide to the results that may be expected from these two soil types in Iroquois county when they are fertilized and managed as the Joliet field has been. Table 5, on page 34, gives the results from this field.

Rock phosphate has been applied to the six series on the Joliet field at rates varying from 8,000 to 8,500 pounds an acre. The first application was made in 1914 and the last in the fall of 1933. Large and consistent increases in yields followed these applications of rock phosphate, but the increases due to them have been smaller and less consistent in the manure, or livestock, system of farming than in the residues, or grain, system. Corn increases due to rock phosphate were larger during the ten years 1937 through 1946 than before.

From the above results we can conclude that rock phosphate will return a good profit on Elliott silt loam even when applied in large amounts.

Another experiment on the Joliet field tests the effectiveness of rock phosphate applied at different rates. Limited data indicate that for initial applications moderate amounts are almost as effective as large amounts. In this experiment, conducted from 1928 through 1942, yields of wheat and clover-alfalfa hay were only about 10 percent lower where 1,000 pounds of rock phosphate an acre was applied than where 4,000 pounds was applied. Other experiments indicate that superphosphate also gives substantial crop increases on the Joliet field. In tests of various carriers applied in amounts equal in money values, higher yields of wheat were obtained with superphosphate than with rock phosphate, but for clover-alfalfa hay the reverse was true.

Applications of potash on the Joliet field have brought increased yields of corn, wheat, clover, and alfalfa, but the increases have not been large enough on four of the six series to pay for the cost of the potash. The applications were, however, rather large. Kainit, in amounts varying from 3,600 to 4,200 pounds an acre, was applied to the various series from 1914 to 1933. Potassium chloride has been used since 1932 in amounts ranging from 1,100 to 1,300 pounds an acre on the various series during the fifteen years to and including 1946. It might be that smaller applications would give profitable returns. The only way to know what is best for a particular field is to test the soil, and if potassium is deficient, to apply the amount which the test indicates is needed.

Table 5. — ROCK PHOSPHATE AND POTASH EXPERIMENTS

Joliet Experiment Field in Will County, 1915-1946

(Located mainly on Elliott silt loam and Swygert silt loam to silty clay loam

Series No.	Average annual yields per acre									
	CORN		OATS		SOYBEANS		WHEAT		CLOVER	
	ROCK PHOSPHATE — Residues system									
	RLrP	Increase for rP	RLrP	Increase for rP	RLrP	Increase for rP	RLrP	Increase for rP	RLrP	Increase for rP
	bu.	bu.	bu.	bu.	bu.	bu.	bu.	bu.	tons	tons
100	48.3	6.8	59.5	9.6	21 4	.1	31.0	9.0	.93	.48
200	48.5	6.7	55.2	4.6	19 4	1.9	29.2	12.1	1.65	.73
300	46.9	9.9	58.6	7.1	19.7	2.4	29.7	8.0	1.41	.46
400	51.1	7.2	63 0	6.3	22.3	3.2	32.3	9.3	1.12	.43
500	50 6	8.0	62.4	9.6	17.1	.3	29.7	12.2	1.19	.56
600	52.9	5.5	65.9	5.3	25.8	.7	25.6	6.2	.83	.19
Average[d]	**49.7**	**7.4****	**60.8**	**7.1****	**21.0**	**1.4***	**29.6**	**9.5****	**1 19**	**48****
	ROCK PHOSPHATE — Manure system									
	MLrP	Increase for rP	MLrP	Increase for rP	MLrP	Increase for rP	MLrP	Increase for rP	MLrP	Increase for rP
	bu.	bu.	bu.	bu.	bu.	bu.	bu.	bu.	tons	tons
100	57.8	.1	61.5	2.4	23.8	−1.8	32.9	4.4	2.13	.63
200	52.3	1.9	63.2	2.6	20.4	−.2	26.8	8.0	1.56	.03
300	50.2	.2	61.0	.5	31.4	2.2	30.2	2.2	2.25	.24
400	59.5	4.7	71.2	7.8	27.1	1.5	31.7	5.2	2.21	.44
500	55.1	2.6	64.3	1.9	20.0	−3.7	30.5	7.9	1.81	.73
600	49.6	−.2	64.1	−.7	33.2	3.1	26.1	4.6	1.50	.25
Average[d]	**54.1**	**1.6**	**64.2**	**2.4****	**26.0**	**.2**	**29.7**	**5.4****	**1.91**	**.39****
	POTASH — Residues system									
	RLrPK	Increase for K	RLrPK	Increase for K	RLrPK	Increase for K	RLrPK	Increase for K	RLrPK	Increase for K
	bu.	bu.	bu.	bu.	bu.	bu.	bu.	bu.	tons	tons
100	55.0	6.7	58.5	−1.0	22.6	1 2	32.9	1.9	1.04	.11
200	57.8	9 3	68.2	1.6	23.5	4.1	34.6	5.4	1.80	.15
300	53.6	6.7	59.4	.8	20.9	1.2	29.9	.2	1.64	.23
400	56.2	5.1	63.8	.8	23.2	.9	34.9	2.6	1.25	.13
500	55.0	4.4	66.8	4.4	15.5	−1 6	34.8	5.1	1.32	.13
600	51.8	−1 1	63.9	−2 0	25.6	− 2	25.7	.1	.68	.08
Average[d]	**54 9**	**5.2****	**63.4**	**.8**	**21.9**	**.9**	**32.1**	**2.6****	**1.40**	**.14****

KEY TO SOIL-TREATMENT SYMBOLS: R = residues, M = manure, L = limestone, rP = rock phosphate, K = potash.

[a] Crop prices from Illinois Cooperative Crop Reporting Service; rock phosphate and potash are included at cost.

[b] Returns from yield increases less cost of rock phosphate or potash.

[c] Returns from yield increases less cost of rock phosphate or potash plus or minus interest at 4 percent earned or paid out on capital inv

[d] Tests of significance were applied only to average crop yield increases. *Odds are more than 19 to 1 that the yield increase is not due t the yield increase is not due to chance.

Clarence silt loam to silty clay loam (147)

Clarence silt loam to silty clay loam is a medium-dark soil formed from a thin blanket of loess on very compact and very plastic calcareous glacial till or lake-bed clay. It is found on gently to moderately sloping areas, where it has developed under prairie-grass vegetation. In Iroquois county it occurs mainly north and east of Loda.

Soil profile. The surface horizon of Clarence, where not severely eroded, is a brown to grayish-brown heavy silt loam or silty clay loam. It is 4 to 8 inches thick and is medium in organic matter and medium acid.

The subsurface is a grayish-brown to brownish-gray heavy silt loam to silty clay loam. The subsoil, which begins at a depth of 10 to 14 inches, is a brownish-gray to yellowish-gray silty clay to clay, very compact and very plastic. Beneath the subsoil, usually at a depth of 25 to 30 inches, the material is either very heavy calcareous glacial till or lake-bed clay that water penetrates very slowly.

Use and management. Clarence silt loam presents difficult problems in use and management. It erodes easily because the subsoil and underlying till take up water very slowly. Surface runoff is greater on Clarence than on soils through which water seeps more easily. Even under good management, this soil is capable of producing only moderate yields (see Table 1, page 8).

In the successful management of Clarence silt loam, besides using a good rotation, it is necessary to cut down erosion losses to the minimum, provide surface drainage to carry off surplus water, add limestone where needed, and keep the soil as fertile as possible and in the best possible tilth.

Erosion is best controlled by a well-established permanent grass-and-clover sod. Cultivated crops should be grown as infrequently as practicable and always in a rotation which includes a sod crop at regular intervals. Corn should be planted on the contour, leading into well-sodded waterways. A large concentration of water must be avoided throughout the cultivated area, and the flow of water should be as slow as possible to avoid soil losses.

Clarence is not well adapted to terracing. During dry weather the terrace ridges often crack and, unless these cracks are filled in, runoff water will channel through them, causing further damage. Sod for terrace outlets and for grass waterways is hard to get started and hard to keep up. This is especially true where the underlying till as well as the subsoil is exposed.

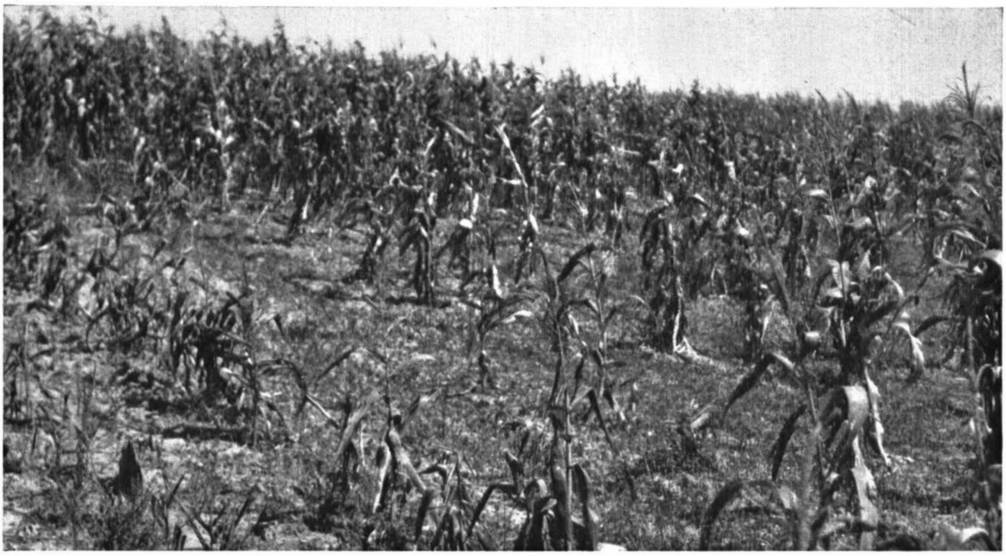
Clarence takes up water slowly and dries out slowly. Tile are not effective and ponded areas should be surface-drained. Fall plowing is recommended on nearly level areas but should be avoided on areas that slope more than 1 or 2 percent. Illinois Circular 604, "Shall We Fall-plow or Spring-plow in Northeastern Illinois?" gives some information on where and where not to plow in the fall.

The seriousness of the erosion problem on Clarence cannot be overemphasized. The loss of the thin covering of silty material exposes the underlying highly compact and plastic material, permanently reducing the agricultural value of this soil. Some soils can be restored to normal production after being severely eroded, but Clarence is not one of these soils.

There is no experiment field on Clarence silt loam, but it is reasonable to suppose that on areas not eroded or only slightly eroded, phosphate will give fair

returns. The soil tests should be made and if they show that available phosphorus is deficient, rock phosphate or superphosphate should be applied. Crops are not so likely to give a good response to potash as to phosphate.

Correction of acidity is necessary on most fields of Clarence silt loam.



An area of Clarence silt loam that is well along toward permanent destruction as a result of erosion. Only good management can save this soil from being completely washed away. Fig. 10

On this stretch of Clarence silt loam are to be seen many spots from which the silty covering has been completely removed. The eroded spots are almost worthless and the productivity of the whole field has been greatly reduced. Fig. 11

Proctor silt loam (148)

Proctor silt loam is a medium-dark soil formed from silty material on coarse sandy and pebbly outwash. It has developed on very gentle to moderate slopes under prairie vegetation and occurs chiefly along Sugar creek east of Milford.

Soil profile. The surface horizon of Proctor is a medium-brown to light-brown silt loam 6 to 8 inches thick. It is medium in organic matter and nitrogen and medium acid. A small amount of sand and a few pebbles may occur in the surface layer as well as throughout the profile. The subsurface is a brownish-yellow silt loam. The subsoil, which begins at a depth of 15 to 18 inches, is a brownish-yellow slightly plastic silty or sandy clay loam. At a depth of 30 to 40 inches the subsoil grades into layers of loose silt, sand, and gravel.

Use and management. There is a tendency for Proctor to be drouthy in spots where the underlying sand or gravel occurs nearer than about 35 inches beneath the surface. This, however, is a minor problem, for most areas of Proctor hold water well.

Fresh organic matter should be supplied, as Proctor is rather low in this important material. The soil should be tested for lime and available phosphorus and potassium, and any deficiencies corrected. It will then be possible to use a good rotation, including legumes, which supply nitrogen as well as organic matter.

The glacial outwash and river terrace formations often are underlain by sand and gravel of commercial value. These are promising areas for prospecting for these materials.

Brenton silt loam (149)

Brenton silt loam is a dark soil formed from silty outwash or from a thin blanket of loess, a wind-deposited material, on silty or sandy outwash. It has developed on nearly level to very gently sloping areas under prairie vegetation.

Soil profile. The surface horizon is a brown to dark-brown heavy silt loam 8 to 10 inches thick, high in organic matter and nitrogen and medium to slightly acid. The subsurface is a brown or dark grayish-brown heavy silt loam 4 to 8 inches thick. The subsoil is 15 to 25 inches thick and is a mixed yellow, gray, and brown, moderately plastic silty clay loam. Beneath the subsoil are layers of silt, sand, and gravel of varying thicknesses. These materials may or may not be calcareous. Sometimes glacial till may occur below a depth of about 45 or 50 inches.

Limited areas of Brenton as well as of Proctor silt loam are mapped along Iroquois river east of Watseka on low terraces which are frequently covered by high flood water. These areas are hard to distinguish from the bottom, show no profile development, and the surface is often alkaline in reaction.

Use and management. Brenton silt loam is a productive soil. It is well supplied with organic matter, only slightly to moderately acid, and generally well supplied with the plant-food nutrients.

Brenton has moderate to slow surface drainage and moderate underdrainage. The soil profile is permeable to water throughout, and tile draw satisfactorily. However, if the underlying glacial till is heavy and occurs at a depth of less than about 45 inches, there may be some difficulty with underdrainage.

This soil has characteristics intermediate between Proctor silt loam and Drummer clay loam. Soil tests should be made to detect any nutrient deficiencies, and treatment should be applied in accordance with the needs as indicated by the soil tests. On Brenton silt loam, soil tests are particularly important as a guide in fertilization because there is no experiment field on this soil type that can be used to give additional guidance. With good soil and crop management, this soil will remain productive indefinitely.

Ridgeville fine sandy loam (151)

Ridgeville fine sandy loam is a dark soil formed from sandy glacial outwash. It occurs on nearly level to gently sloping areas.

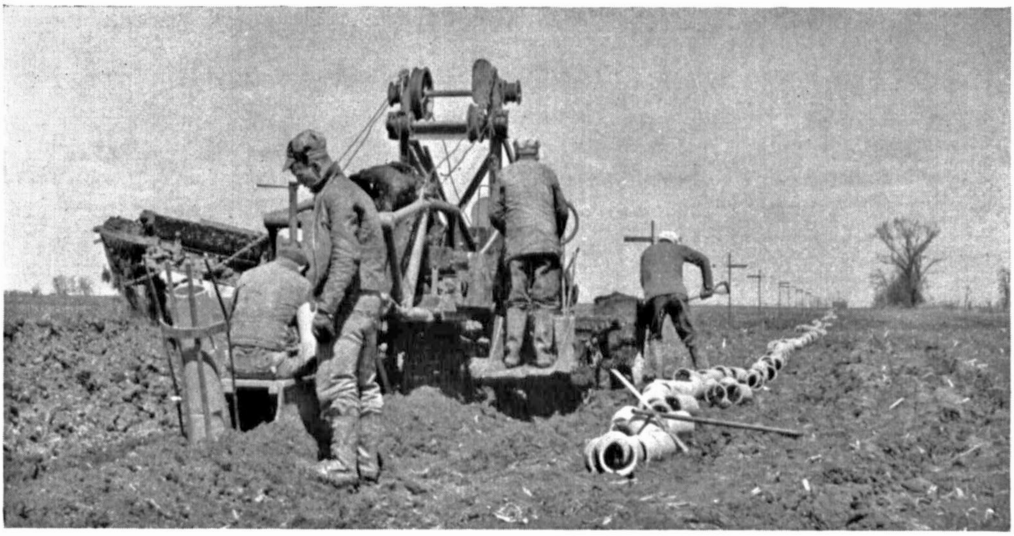
Soil profile. The surface horizon is a brown to dark-brown fine sandy loam 8 to 10 inches thick, medium in nitrogen and organic matter and medium to slightly acid. The subsurface is a yellowish to grayish-brown fine sandy loam 6 to 8 inches thick. The subsoil is 15 to 20 inches thick and is a mixed gray, yellowish-brown, and yellowish-gray medium-plastic sandy clay loam. The material beneath the subsoil is stratified sand and gravel with occasional strata of silt and clay.

Use and management. Much of the Ridgeville fine sandy loam has enough slope for good surface drainage. The portions of the type needing underdrainage can be tiled without difficulty as this soil is permeable to water and tile draw well. In planning large-scale drainage, some thought should be given to maintaining the water table at a depth of about 30 inches, as this soil has a tendency to be slightly drouthy. It is necessary to add fresh organic matter at frequent intervals because decomposition is rapid in sandy soils, making it impossible to build up a reserve supply of either organic matter or nitrogen. Manure should be applied at moderate rates but as frequently as the supply makes possible. Soil tests for acidity, available phosphorus, and potassium should be made and the liming and fertilizing program be guided by the results of the tests. If the tests show a deficiency of available phosphorus, this soil will respond to either superphosphate or rock phosphate.

Drummer clay loam (152)

Drummer clay loam is a dark soil formed from mixed sand-silt-and-clay outwash or lake-bed sediments. It has developed under marsh-grass vegetation on areas that are nearly level or depressional. It is one of the more extensive types in Iroquois county, occupying nearly 63,000 acres. A few areas of Harpster too small to be shown on the soil map are included in Drummer.

Soil profile. The surface horizon of this type is a granular black clay loam to silty clay loam 10 to 12 inches thick, high in organic matter and nitrogen, and slightly acid to neutral. The subsurface is hard to distinguish as a separate horizon but is usually a very dark-gray or grayish-black clay loam or silty clay loam. At a depth of 12 to 16 inches it grades into a mottled dark-gray or brownish-gray medium-plastic clay loam to silty clay loam. Below a depth of 30 to 35 inches the material is usually calcareous and consists of layers of clay,



Tile provide effective drainage for Drummer clay loam, a type that cannot be farmed satisfactorily unless it is drained. Other heavy-textured soils that can be drained with tile if an outlet can be found are Harpster clay loam, Milford clay loam to clay, Pella clay loam, and Ashkum clay loam to silty clay loam. Fig. 12

silt, and sand, with perhaps some gravel below 40 to 50 inches. Occasional areas occur that are somewhat gravelly in the surface, but the amount of gravel is too small to be of any agricultural importance.

Use and management. Drummer clay loam is a productive soil if well drained and well farmed. Fall plowing is advisable in order to avoid too much delay when the spring is late. Fresh organic matter should be provided, and deep-rooting legumes should be included in the rotation in order to keep the deeper parts of the profile porous.

Although Drummer will usually grow sweet clover without limestone, it should be tested for acidity as well as for available phosphorus and potassium. With good farming, this soil will remain productive indefinitely. It erodes only when water from higher land runs across it.

The most difficult problem in the management of Drummer, after good drainage has been provided, is to keep the soil from losing its good physical condition. Too much cropping to corn and soybeans during recent years has resulted in an increasingly poor physical condition, causing slower underdrainage and greater difficulty in working down a good seedbed. Rebuilding good tilth is slow work, and the sooner good cropping practices are used, the less trouble there will be in the future.

Pella clay loam (153)

Pella clay loam is a dark soil formed from fine-textured glacial outwash and lake-bed sediments. It occurs on nearly level to slightly depressional areas. The largest area of this soil in Iroquois county occurs in the west-central part

of the county bordering Ford county. Another sizable area occurs east of Iroquois river in Martinton and Papineau townships.

Soil profile. The surface horizon is a black to slightly grayish-black clay loam or silty clay loam to clay 8 to 15 inches thick. It is high in organic matter and nitrogen and nonacid. The subsurface is not well developed and frequently cannot be distinguished from the surface soil. The subsoil is a dark-gray moderately plastic clay loam to clay with pale-yellow spots. At a depth of 24 to 30 inches lime concretions often are abundant. A few lime concretions occur throughout the rest of the profile and even on the surface. Layers of sand, silt, and clay occur at a depth of 3 or 4 feet.

Use and management. Surface drainage on Pella clay loam is slow but tile draw well. The only difficulty in tiling is to get good outlets. It is advisable to fall-plow Pella in order to avoid too much delay when the spring is late.

Although this soil has never been found acid, the acidity test should be made when testing any samples for available phosphorus and potassium. Small areas of an alkaline soil, known as Harpster clay loam, occur in Pella. These areas generally need potash. In sampling Pella for testing, it is important to recognize these small alkaline areas, for one of them may be on a spot chosen for sampling. If a sample is taken from such an area, the results of the tests would not apply to the major portion of the field.

Pella is a productive soil if well drained, and it will remain productive indefinitely if adequate provision is made for maintaining the supplies of organic matter and nitrogen and for adding phosphate and potash when the tests show either or both to be deficient. This soil, as do all heavy soils, tends to develop a compacted subsurface which interferes with underdrainage. To avoid this danger, deep-rooting legumes should be grown in the rotation and plowing should be done only when the subsurface is not too wet.

Proctor silt loam, rolling phase (155)

The origin and formation of Proctor silt loam, rolling phase, is the same as that of the more level Proctor silt loam, page 37, but this rolling phase occurs on steeper slopes. This soil is a minor type in Iroquois county, occupying a total area of less than one square mile. It belongs to the dark, or prairie-soil, group but has a lighter colored surface soil than Proctor silt loam and is more yellowish in the deeper horizons.

Use and management. Proctor silt loam, rolling phase, is subject to severe erosion and is more drouthy than the more level phase. This rolling phase should be farmed on the contour whenever possible. It is well adapted to terracing wherever the slopes are long enough to permit terrace construction. Soil tests should be made, such treatments applied as the tests indicate are needed, and a rotation adopted in which meadow and pasture are given an important place. This soil is well adapted to alfalfa after it has been properly limed and fertilized.

Rankin sandy loam (157)

Rankin sandy loam is a minor type in Iroquois county, occupying a total area of less than one square mile. It is formed from sandy material deposited by wind

and water on compact calcareous glacial till. It belongs to the dark, or prairie-soil, group but is deficient in organic matter.

Soil profile. The surface horizon is a brown to light-brown sandy loam to loamy fine sand 6 to 10 inches thick. It is low in nitrogen and organic matter and is medium acid. The subsurface is not easily distinguished from the surface but usually is more yellowish because it contains less organic matter. The subsoil is a brownish-yellow slightly plastic clayey sand. There is considerable variation in the depth to the till, although usually it occurs at a depth of about 35 inches.

Use and management. Rankin sandy loam is not a productive soil. It is drouthy for corn. After it is limed and fertilized to correct shortages indicated by the soil tests, it is best adapted to the small grains, alfalfa, and the grasses.

Vance silt loam (158)

Vance silt loam is a light-colored soil formed from a thin blanket of silty material on sandy, gravelly glacial outwash. It occurs on nearly level to gently sloping areas and is found mainly along Iroquois river near Watseka and along Sugar creek near Milford.

Soil profile. The surface horizon of Vance is a yellowish-gray silt loam 5 to 8 inches thick. It is low in nitrogen and organic matter and is moderately acid. The subsurface has a somewhat more yellowish cast than the surface soil and is a friable silt loam 6 to 8 inches thick. The subsoil, which begins at a depth of 15 to 18 inches, is a brownish-yellow medium-plastic silty clay loam. Some gray and yellow spots, splotches, and streaks occur in the lower part of the subsoil. Underlying the subsoil are layers of silty, sandy, and gravelly materials that are sometimes calcareous at a depth of 40 to 50 inches.

Use and management. Since Vance silt loam is very low in nitrogen and organic matter, these deficiencies have to be corrected before it will grow satisfactory crops. Soil tests should be made and the needed limestone and fertilizers applied, and then a rotation adopted which will provide for frequent additions of leguminous organic matter. If the tests show that available phosphorus is deficient, superphosphate will probably give better returns than rock phosphate.

The more level portions of this type are in need of tiling. Tile draw well and there is no difficulty in improving the underdrainage.

Vance silt loam is not a "strong" soil but it responds well to good farming. It does not produce satisfactory yields unless well farmed under a program that provides adequate amounts of nitrogen and fresh organic matter.

Martinton silt loam (189)

Martinton silt loam is a dark soil formed from heavy glacial outwash and lake-bed sediments. It occurs in small areas on very gentle slopes. It is found chiefly in the Gilman region and from the Cissna Park region northwest to the Del Rey region. This soil is similar to Brenton silt loam but is derived from heavier sediments and has a somewhat heavier subsoil.

Soil profile. The surface horizon is a brown to dark-brown heavy silt loam 8 to 11 inches thick. It is fairly high in

nitrogen and organic matter and slightly to moderately acid. The subsurface is a brown to yellowish-brown heavy silt loam to silty clay loam 6 to 8 inches thick. The subsoil is a mixed yellowish-brown and yellowish-gray heavy silty clay loam or silty clay 16 to 20 inches thick. The materials beneath the subsoil are usually clayey glacial sediments and lake-bed deposits that are calcareous below a depth of about 35 to 40 inches. Sandy and silty layers may sometimes be present beneath the subsoil.

Use and management. Martinton silt loam is a productive, durable soil. It underdrains well for a heavy soil, and with good farming will remain productive indefinitely. As a precaution against possible deficiencies, it should be tested for acidity, available phosphorus, and potassium. Adequate provision should be made for supplying organic matter and nitrogen by using a good rotation. There is danger of this soil gradually becoming less permeable to water and wet spots developing unless deep-rooting legumes are grown in the rotation and tilling is done only when the soil is not too wet. It is easier to keep a soil in good physical condition than to cure a bad condition that has been allowed to develop.

Onarga fine sandy loam (190)

Onarga fine sandy loam is a moderately dark soil formed from sandy sediments on gentle to moderate slopes. It occurs in association with Hagener loamy fine sand (98) and differs from it chiefly in having more of the finer soil particles in the upper part of the profile and a zone of clay accumulation forming the subsoil.

Soil profile. The surface horizon is a brown to light-brown fine sandy loam 4 to 8 inches thick, low in nitrogen and organic matter and medium acid. The subsurface is a light-brown to yellowish-brown fine sandy loam and the subsoil is a slightly plastic yellowish or brownish-yellow fine sandy clay loam. The knolls and ridges are lighter colored, have less clay accumulation in the subsoil, and are somewhat drouthy.

Use and management. Both surface drainage and underdrainage of Onarga fine sandy loam range from good to excessive. Since this soil is sandy and easily leached, it is impossible to build up a reserve of organic matter and, if corn is grown, it should be preceded by clover or alfalfa. Onarga is an excellent soil for alfalfa; but before seeding alfalfa or the clovers, soil tests should be made and limestone and the deficient plant nutrients applied as indicated by the tests. A soil such as Onarga fine sandy loam deteriorates rapidly unless well farmed. The information available indicates, however, that this soil will respond to good farming and fertilizing.

For further discussion of the management of sandy soils turn to pages 13 to 16.

Del Rey silt loam (192)

Del Rey silt loam is a light-colored soil formed from heavy glacial outwash and lake-bed sediments. It is similar to Vance silt loam, page 41, except that it has a much heavier subsoil.

Soil profile. The surface horizon is yellowish-gray light silt loam 5 to 6 inches thick. It is medium acid and low in nitrogen and organic matter. The subsurface is a grayish-yellow floury silt

loam 2 to 8 inches thick. The subsoil is a mixed brownish-yellow, yellow, and gray silty clay loam to clay 16 to 24 inches thick. It is heavy and plastic. Beneath the subsoil there are calcareous lake-bed and glacial outwash silts and clays.

Use and management. So far as is known, the management requirements of Del Rey silt loam are the same as those of Vance silt loam (see page 41). The only difference known which affects management is the slower underdrainage of Del Rey.

Elliott silt loam, rolling phase (193)

Elliott silt loam, rolling phase, is a moderately dark soil formed from a thin blanket of silty material on compact calcareous glacial till of a silty clay loam texture. It occurs on moderate slopes and is subject to severe erosion. Fortunately it is a minor type in Iroquois county, totalling about 7 square miles.

This soil may be thought of as intermediate in character between Elliott silt loam and Varna silt loam. Surface runoff is more rapid than on the more level phase of Elliott but less rapid than on Varna, and it is intermediate between these two in tendency to erode.

Soil profile. The profile of Elliott silt loam, rolling phase, varies in thickness because of differences in erosion. The following description applies to those areas that are not severely eroded.

The surface horizon is a brown silt loam 5 to 7 inches thick. It is medium in nitrogen and organic matter and medium acid. The subsurface is a light-brown or yellowish-brown silt loam 2 to 8 inches thick. The subsoil is from 16 to 20 inches thick and is a pale yellowish-brown medium-compact and medium-plastic clay loam. The material below a depth of 25 to 35 inches is a compact calcareous glacial till that is moderately slowly permeable to water.

Use and management. Elliott silt loam, rolling phase, should be used primarily for pasture and meadow. Intertilled crops may be grown at infrequent intervals after a good sod has been plowed down. The intertilled crops should, however, always be planted on the contour, and the contours should lead into grass waterways.

Soil tests should be made and limestone and fertilizer applied as needed, so that a vigorous vegetative growth may be secured. Erosion cannot be effectively controlled without such vegetation. Fall plowing should be avoided, but if it is necessary it should be done on the contour and the plowed surface should be left rough.

Harpster fine sandy loam (196)

Harpster fine sandy loam is a dark soil formed from sandy and fine-sandy water-deposited sediments. It is a minor type in Iroquois county, occupying a total of only about 6 square miles. It is important, however, to recognize this soil, as it is always alkaline and low in available potassium. It occurs in association with soils derived from sandy glacial outwash, such as Pittwood, La-Hogue, and Ridgeville.

Soil profile. The surface horizon is a dark-brown to black fine sandy loam 6 to 10 inches thick. The subsurface is a grayish-brown fine sandy loam 10 to 20 inches thick. Both the surface and subsurface horizons are always high in lime.

The subsoil is a moderately plastic fine sandy loam to fine sandy clay loam 10 to 15 inches thick. Beneath the subsoil water-deposited sandy and silty materials occur.

Use and management. Harpster fine sandy loam was formed under swampy conditions. Where this condition still prevails, it must be corrected before the soil can be successfully farmed. After providing for adequate drainage, muriate of potash or a mixed fertilizer high in potash, such as 0-9-27 or 0-10-20, should be applied for each grain crop.

It is not likely that rock phosphate would be a good source of phosphorus on this alkaline soil.

Saybrook sandy loam (204)

Saybrook sandy loam is a dark soil formed from wind- or water-deposited sandy sediments on calcareous permeable glacial till. It occurs on gentle slopes and has both good surface drainage and good underdrainage.

Soil profile. The surface horizon is a brown sandy loam 6 to 10 inches thick, medium low in nitrogen and organic matter and medium acid. The subsurface is a light-brown sandy loam, and the subsoil is a yellowish-brown sandy clay loam. Immediately beneath the subsoil there is often a thin stratum of leached pebbly sand, and beneath this sandy layer is pebbly calcareous glacial till. This glacial till is the same kind that underlies Saybrook silt loam (145).

Use and management. Saybrook sandy loam occurs so mixed with Watseka loamy fine sand (49), described on page 21, that the two are shown together on the soil map. Saybrook holds water better than Watseka and is a better soil, but the intimate mixing of these two soils makes it necessary to farm them in the same way. For management suggestions see Watseka loamy fine sand, page 21, and the general discussion on managing sandy soils, pages 13 to 16.

Thorp silt loam (206)

Thorp silt loam is a medium-dark soil formed from silty outwash. It has developed under weedy prairie vegetation and occurs on nearly level to depressional areas. Thorp occupies a total area of only about 1,500 acres in Iroquois county. It is important to recognize this soil, however, because it is hard to drain and often forms wet spots. A few of these spots have a grayer surface soil and a more plastic subsoil than are typical for Thorp.

Soil profile. The surface horizon is a brown to grayish-brown silt loam 6 to 8 inches thick, medium in organic matter and nitrogen, and medium acid. The subsurface is a brownish-gray silt loam often mottled with rusty brown. The subsoil begins at a depth of 15 to 18 inches. It is a mixed gray, brownish-gray, and yellowish-brown plastic clay loam or clay. Layers of silt, sand, and gravel occur below 35 or 40 inches.

Use and management. Tile draw slowly in Thorp, and often it is difficult to establish surface drainage because of the low-lying position of many areas of Thorp. As soon as there is satisfactory drainage, enough limestone should be applied to correct acidity. Then it will be possible to grow sweet clover, which tends to loosen the soil and improve

underdrainage. When the clover is turned under, it will also supply fresh organic matter and add more nitrogen to the soil. Heavy applications of manure will also supply nitrogen and organic matter and will contribute small amounts of available phosphorus and potassium.

This soil is not highly productive because of its rather unfavorable physical condition. Under good management, however, small grains, soybeans, and clovers are likely to produce satisfactory yields, and in favorable seasons corn can usually be counted on to do well. Alfalfa, on the other hand, is a doubtful crop on Thorp silt loam.

Saybrook silt loam, rolling phase (221)

Saybrook silt loam, rolling phase, is a dark soil formed from a thin blanket of silty material on permeable calcareous glacial till. It includes the rolling portions of Saybrook silt loam and is similar to it except that its profile is thinner and more yellowish. The thinness of the profile varies according to the amount of erosion that has taken place.

Soil profile. The surface horizon is a light-brown silt loam, often slightly sandy or pebbly. It is low to medium in nitrogen and organic matter and medium to slightly acid. This horizon is absent on the more severely eroded areas. The subsurface is a yellowish-brown silt loam, often pebbly and slightly sandy. The subsoil is a medium-compact and slightly plastic pebbly silty clay loam. In a few small areas where erosion has been active the underlying calcareous glacial till is exposed.

Use and management. The major problem in the management of Saybrook silt loam, rolling phase, is the control of erosion, though erosion is not so harmful on this soil as on Elliott, Swygert, and Clarence, which may be permanently damaged or completely destroyed by it. Loss of the silty loess blanket by erosion reduces the agricultural value of Saybrook and forces a change in its use. It is therefore important that erosion be checked before much of the silty blanket has been removed, for this silty material forms a much better soil than does the underlying glacial till.

This soil should be thoroughly tested, and limestone and fertilizer as called for by the tests should be applied. This will make vigorous vegetation possible, which is essential for erosion control. Fall plowing should be avoided, and all tillage should be on the contour. Grass waterways should be constructed, and as much vegetative material as possible left on the surface for fall, winter, and early spring protection. When corn is grown, rolling the stalks down at right angles to the slope has proved effective in reducing erosion.

Varna silt loam (223)

Varna silt loam is a medium-dark soil formed from thin loess on compact calcareous till that is moderately slowly permeable to water. It has developed on strongly sloping land under prairie vegetation and usually is associated with Elliott silt loam.

Soil profile. The profile of Varna silt loam varies, particularly in thickness, because of the different amounts of soil material that have been lost by erosion. The following description applies to areas where there has been little loss of soil material.

The surface horizon is a brown to light-brown silt loam 4 to 6 inches thick, medium in organic matter and nitrogen, and medium acid. The subsurface is a yellowish-brown silt loam. At 8 to 12 inches it grades into the subsoil, which is a yellowish-brown medium-plastic silty clay loam. Below a depth of 25 to 30 inches the till material is identical with that under Elliott silt loam (see page 32).

Use and management. Surface runoff on Varna silt loam is very rapid. To avoid erosion, this soil type should be cropped as little as possible. When manured and limed, it makes fairly good permanent hay and pasture land unless erosion has removed all of the silty loess cover.

If it becomes necessary to crop areas of Varna, all plowing and cultivating should be done on the contour. A rotation of crops should be adopted which includes as little corn or other cultivated crops and as much small grain, hay, and pasture crops as possible. Such a rotation will provide good winter cover. Fall plowing should be strictly avoided.

The full value from barnyard manure is likely to be realized only if the acidity of the soil has been corrected. In order to grow sweet clover, an application of limestone is necessary unless erosion has been so severe that the limey glacial till has become exposed.

How to use areas that are eroded so severely that the unproductive subsoil or glacial till is exposed is a difficult problem, and no satisfactory solution has been found.

Strawn silt loam (224)

Strawn silt loam may be thought of as strongly sloping Miami silt loam described on page 20. It is a minor type in Iroquois county, occupying a total area of about 600 acres. It occurs as small areas in association with Miami.

Soil profile. The profile of Strawn silt loam varies, particularly in thickness, because of the different amounts of erosion from place to place. The following description applies to areas where there has been little recent erosion.

The surface horizon is a grayish-yellow light silt loam about 6 inches thick. It is low in nitrogen and organic matter and medium acid. The subsurface is a grayish-yellow silt loam, and the subsoil is a yellow or brownish-yellow silty clay loam with some pebbles. The subsoil is usually encountered at a depth of 10 to 14 inches. Beneath the subsoil is permeable calcareous glacial till. Sand pockets or lenses of silt and sand are common in the till.

Use and management. Strawn silt loam should be kept in permanent pasture or meadow. If tilled, erosion soon seriously reduces its agricultural value but does not completely destroy it as it does soils underlain by the slowly permeable glacial tills. The soil tests should be made and limestone and fertilizer applied in amounts called for by the tests. The soil should then be seeded to grass and legumes and protected by controlled grazing.

Eylar silt loam (228)

Eylar silt loam is a light-colored soil formed from thin loess on compact plastic calcareous glacial till. In Iroquois county it occurs in scattered areas on

An area of eroded, unproductive pasture on Eylar silt loam with a 3-percent slope. Eroded areas like this have little agricultural value and probably cannot be restored. Slow underdrainage and erosion make Eylar hard to manage. Fig. 13

nearly level to moderately sloping topography in association with both Clarence and Swygert soils.

Soil profile. Some areas of Eylar silt loam have lost a large amount of soil material by erosion. The following description applies to the portions of the type where very little or no erosion has occurred. The surface horizon is a yellowish-gray silt loam 4 to 6 inches thick. It is low in organic matter and nitrogen and probably low in available phosphorus. The subsurface is a yellowish-brown to yellowish-gray silt loam. The subsoil, which begins at a depth of 12 to 16 inches, is a mixed gray, dark brownish-gray, and pale-yellow clay which is compact and plastic. Below a depth of 25 to 30 inches is heavy, plastic calcareous glacial till.

Use and management. Eylar silt loam is not a productive soil. The slow underdrainage and strong tendency to erode, even on gentle slopes, together with its rather low natural productivity, make this soil difficult to manage. It is better adapted to wheat than corn, but is best used as permanent pasture and meadow.

Eylar should be tested for acidity, available phosphorus, and potassium, and any deficiencies shown by the tests should be corrected. Clovers may then be grown either in rotation or in permanent pasture or meadow. Areas that slope more than 2 to 3 percent should not be cultivated but kept in permanent grass.

Monee silt loam (229)

Monee silt loam is a medium-dark soil formed from a thin deposit of loess, a wind-blown silt, or from silt laid down by water on calcareous glacial till that is heavy and plastic. Developed on nearly level or slightly depressional areas under weeds and grass, this type generally occurs in Iroquois county as small patches in the heavy till regions and areas once covered by shallow lakes.

One large area made up mainly of Monee occurs about 2 miles northeast of Buckley, but the soils there are so mixed that they cannot be shown separately on the map. Some portions of this area are slightly better than the average for the type.

Soil profile. The surface horizon of Monee silt loam is a grayish-brown to dark-gray silt loam to silty clay loam about 3 to 6 inches thick. It is medium-low in organic matter and nitrogen and medium acid. The subsurface varies from 0 to 6 inches in thickness. Where present, it is usually a gray to dark-gray silt loam. The subsoil, which begins at a depth varying from 6 to 20 inches, is a pale brownish-gray to olive-brown or olive plastic clay, and is frequently mottled with pale yellow or with rusty brown. Beneath the subsoil there is sometimes a few inches of rather loose silty or loamy material, below which lies heavy, plastic calcareous till or lake-bed clay. Quite often, however, the loose material is absent, and the subsoil grades directly into the underlying heavy till. This till is the same as that under Clarence silt loam to silty clay loam described on page 35.

Use and management. Monee silt loam is a poor soil, similar in many respects to the nearly level portions of Eylar silt loam. The physical limitations are such that expensive treatment is not justified. The productive level will remain low regardless of any present-known treatment. Small grains and soybeans produce fair yields in favorable years. The growing of sweet clover is recommended, though some limestone and possibly a phosphate fertilizer will be needed before this crop can be grown.

Surface drainage can be provided by open ditches or surface inlets to tile, but water moves into and through the subsoil and underlying glacial till so slowly that the soil is cold and wet. Plant roots do not readily penetrate the subsoil. Where the combined surface and subsurface horizons are only 6 to 8 inches thick, the feeding space and the supply of available soil moisture are limited.

Rowe clay loam to clay (230)

Rowe clay loam to clay is a dark soil formed from local deposits of heavy sediments on very plastic calcareous glacial till or heavy lake-bed clay. This type has developed under swampy weed-and-grass vegetation, mainly on areas that are nearly level or somewhat lower than surrounding soils.

Rowe is somewhat variable. The depressional areas, with their grayish surface, resemble Monee silt loam and may be mistaken for it, but they are somewhat more productive. Some areas with a black surface resemble Bryce clay loam to clay. Others with a very heavy surface and thick local deposit of sediment resemble Drummer clay (238). A few areas are covered by silty sediment recently washed from adjacent slopes of silt loam. These and other minor variations are not shown on the soil map.

Soil profile. The surface horizon varies from a very dark-gray to grayish-black silty clay loam to clay. It is 6 to 8 inches thick, medium to high in organic matter and nitrogen, and slightly acid to neutral. The subsurface is difficult to distinguish as a separate horizon, but is usually a dark-gray heavy silty clay loam to clay. At a depth of about 18 inches it grades into a dark-gray or olive-gray plastic clay which is mottled with yellowish gray. Below a depth of 30 to 35 inches is frequently a layer of looser

material several inches thick. Beneath this material lies heavy, plastic, calcareous till or lake-bed clay, like that found under Clarence silt loam to silty clay loam and Monee silt loam (see pages 35 and 47).

Use and management. The heavy nature of Rowe clay loam to clay makes it necessary to provide surface drainage or surface inlets to the tiling system. Tile do not draw fast enough to be effective. Great care must be used not to cultivate this soil when it is too wet. It should be fall-plowed; otherwise spring work is likely to be delayed too long.

Tests for acidity and available phosphorus and potassium are advised even though this soil is usually not acid or only slightly so and is usually well supplied with available phosphorus and potassium. Crop yields are limited by physical condition rather than by deficiencies of plant nutrients. This is one of the soils in the state that demands skilful farming if satisfactory yields are to be obtained and a poor physical condition avoided. Continued growing of shallow-rooted crops, such as corn and soybeans, results in the development of a compacted layer below the surface soil. This condition is very unfavorable to plant growth and its correction is slow and difficult.

Clarence silt loam, eroded phase (231)

Clarence silt loam, eroded phase, was originally covered by a blanket of silty material. Erosion has removed this silty blanket, destroyed the soil profile, and in many places has exposed the underlying heavy, plastic, calcareous glacial till (see Figs. 14 and 15). When this stage of destruction has been reached, the agricultural value of the soil is reduced to near zero, and no way is known of restoring it to even a low productive level. Where even a few inches of the silty cover remain, fairly good pasture can be grown, but when areas are used in this way the grazing should be controlled — otherwise sheet erosion and gullying will continue.

The agricultural future of the Clarence soil regions depends more on preventing the removal of the silty loess blanket by erosion than on restoring areas that are already eroded. Fortunately at the present time the eroded phase of Clarence occupies a total of only about 5 square miles in Iroquois county. Since these areas cannot be restored, the best course now is to make every reasonable effort to prevent their extension.

Ashkum clay loam to silty clay loam (232)

Ashkum clay loam to silty clay loam is a dark soil formed from thin local wash on compact calcareous glacial till. This type has developed on nearly level to very gently sloping areas under heavy marsh-grass vegetation. It occurs extensively to the north of Gilman and in the southeastern part of the county.

Soil profile. The surface horizon of Ashkum is a dark-brown to black clay loam to silty clay loam 8 to 12 inches thick. It is high in organic matter and nitrogen and neutral to slightly acid. The subsurface is seldom a definite horizon but usually changes gradually from the surface soil to the subsoil. The subsoil, which begins at a depth of 15 to 18 inches, is a mixed grayish-brown and yellowish-gray plastic clay loam with

In many places in the Clarence and Swygert soil areas of Iroquois county are eroded slopes like this. Such slopes cannot again be made to grow grain, hay, pasture, or timber at a profit — they are permanently destroyed for that purpose. A challenging task faces owners and operators of these two soils if they are to prevent more such areas from developing. Areas not so severely eroded can often be saved for timber (see Fig. 15). Fig. 14

This planting of Jack pine was set out with two-year-old seedlings in 1942 on an area of Swygert where the natural surface soil and subsoil still remained. Seventy-seven percent of the trees lived. They averaged 12 feet in height in 1950 and were of good quality.

On an adjacent badly eroded area, similar to that shown in Fig. 14, another planting of two-year-old Jack pine seedlings had been made in 1941. Only 4 percent of those trees were living in 1950, and all were on spots where 6 inches or more of subsoil still remained on top of the unweathered till. The trees were only 2 to 7 feet tall and were of poor quality. Fig. 15

yellow spots. Beneath the subsoil there are usually several inches of silty or loamy sediment, below which lies compact calcareous till. This underlying till is the same as that found under Elliott silt loam (see page 32).

Use and management. Ashkum clay loam to silty clay loam is a moderately productive soil (see Table 1). The major problems in its management are drainage and maintenance of good physical condition. Both surface and underdrainage are moderately slow. Tile draw but not so freely as in a more open soil. The tile should be laid closer together and as shallow as is safe. Open ditches or furrows to supplement the tile may be used to advantage where there is an outlet available for surface drainage.

The soil can be kept in good physical condition by the use of a good rotation, including deep-rooting legumes, together with tillage practices suited to a heavy soil. Working this soil when it is too wet puts it in a poor physical condition that persists through at least one winter. Plowing in the fall is advisable, as it improves the physical condition of the soil and lessens the risk of having to plant late in the spring.

The soil tests should be made, and if limestone is needed for the growing of legumes, it should be applied. If the tests show that available phosphorous is low, either superphosphate or rock phosphate will give good crop increases. Where wheat is grown, it probably will be worth while to apply superphosphate. If both available phosphorus and potassium are only slightly deficient, the small amounts needed may be added either in a mixed fertilizer such as 0-20-20 or separately as superphosphate and potash.

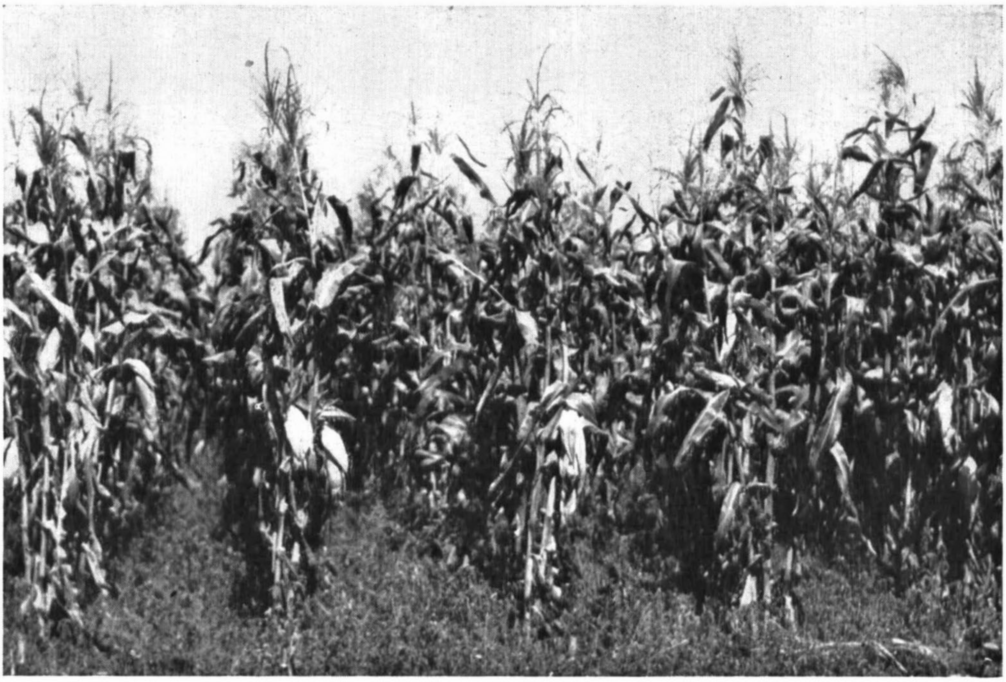
Bryce clay loam to clay (235)

Bryce clay loam to clay is a dark soil formed from heavy local sediment on compact, plastic, calcareous till. It occurs on nearly level to gently sloping areas in association with Swygert silt loam to silty clay loam. In both physical properties and agricultural value it is intermediate between Rowe clay loam to clay and Ashkum clay loam to silty clay loam.

Soil profile. The surface horizon of this type ranges from a black clay loam to a very dark-brown silty clay loam. It is 8 to 12 inches thick, high in organic matter and nitrogen, and neutral to slightly acid. The subsurface is a dark grayish-brown to black clay loam or clay. It seldom occurs as a well-defined horizon but changes gradually from the surface to the subsoil. The subsoil, which begins at a depth of 12 to 16 inches, is a dark-gray plastic clay mottled with pale yellow and dull rusty brown. Sometimes there is a thin layer of silty clay loam sediment between the subsoil and the underlying heavy, plastic, calcareous till. The underlying till is the same as that under Swygert silt loam to silty clay loam.

Use and management. Drainage and the maintenance of good tilth are the first problems in the management of this soil. Tile are only moderately effective because water moves so slowly through the subsoil and underlying glacial till. Surface drainage is slow on the more level portions of the type. If a tiling system is installed, surface inlets might well supplement the underdrainage system.

It is important to keep this soil in as good tilth as possible; otherwise a good seedbed becomes more and more difficult to prepare. Good tilth can be maintained by supplying plenty of fresh organic



Bryce clay loam to clay is good corn soil but hard to drain and heavy to work. Wise use of legumes and crop residues will improve its tilth. For satisfactory drainage, open ditches or surface inlets into tile systems are needed. Fig. 16

matter by growing deep-rooting legumes and turning under crop residues, and by working the soil only when it is neither too wet nor too dry.

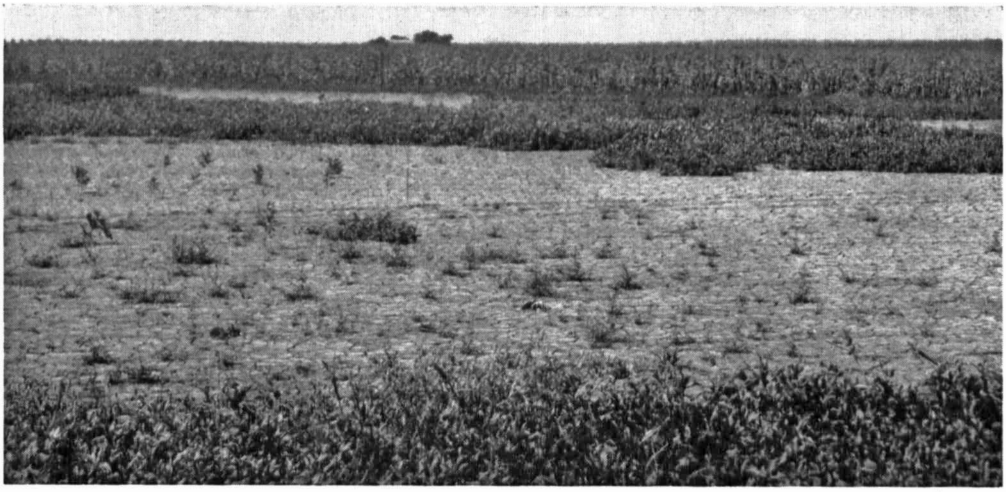
If the soil tests show acidity, the required amount of limestone should be applied so that clovers may be grown. If available phosphorus is very deficient, rock phosphate will probably give satisfactory crop increases. If the phosphorus test is medium, superphosphate would probably be better on this soil than rock phosphate. If the content of both phosphorus and potassium is medium, these materials may be added in a mixed fertilizer, such as 0-20-20, or they may be added separately as superphosphate and potash.

Drummer clay (238)[1]

Drummer clay is a dark soil formed from heavy local water-deposited sediments. It has developed only in depressions under a covering of coarse grass and sedge. It is a minor type. and is found in small areas chiefly throughout the slowly permeable till regions of the county.

Soil profile. There is little horizon development in Drummer clay — no definite separation into surface, subsurface, and subsoil can be made. The upper 15 to 20 inches of the profile is black or grayish-black heavy clay loam or clay. Below this it grades gradually into dark gray, with pale-yellow and rusty-brown spots. The entire profile is heavy and

[1] Subsequent to the preparation of the Iroquois county soil map the name Drummer clay was changed to Rantoul silty clay.



Small patches of Drummer clay, No. 238, like this occur throughout the county but particularly in the heavy till regions. Having no natural outlet, these spots become shallow ponds in spring and fall. When undrained, they have little agricultural value and interfere with the working of the rest of the field. In many areas it is desirable to construct open ditch outlets even though the spots have been previously tiled. The excess dirt from the ditch may be scraped into the depression. Fig. 17

plastic. Below a depth of about 30 inches the clayey sediment is usually somewhat less plastic and at about 45 inches glacial till or glacial outwash is found.

Use and management. There is no surface drainage on Drummer clay, and underdrainage is slow. Tile do not draw readily. After heavy rains, surface runoff from surrounding higher land collects and often drowns the crops.

Drummer clay is difficult to farm profitably. It often occurs in spots so small and isolated that no special treatment is justified. However, where an area is large enough or where several small spots occur close together and an outlet can be obtained, a special drainage system may be worth while. When undrained, these small areas remain wet long after the adjacent soils are ready to be cultivated. Since these patches often must be avoided in plowing and left unplanted when the rest of the field is prepared, they interfere with work and make tillage more difficult.

Surface drainage can sometimes be provided by open ditches. If this method is impractical, a catch basin or open tile inlet is often advisable. When this soil is well drained, it is best adapted to corn and sweet clover. A potash fertilizer may be needed in order to get satisfactory corn yields. Small grains tend to grow very rank and lodge.

Areas of Drummer clay that cannot be drained and are left in weeds and shrubs can be useful as a refuge for wildlife.

Eylar silt loam, eroded phase (241)

Eylar silt loam, eroded phase, differs from the uneroded phase, page 46, in that most or all of the silty blanket that was originally present has been removed by erosion. This eroded phase occupies a total area in Iroquois county of about 4 square miles. It is low in agricultural value, and no way is known of restoring

its producing capacity. It will not grow even fair pasture, and attempts to start trees on it have failed, as they have on eroded areas of Clarence and Swygert (see Fig. 14, page 50). Neither grass nor trees can take root in the heavy, plastic glacial till or the lake-bed clay which has been exposed by erosion.

GROUPING OF SOILS OF IROQUOIS COUNTY

The soil pattern of Iroquois county is complex, particularly in the sandy region along Sugar creek and north and northeast of Watseka. Ten types, however, occupy about 70 percent of the total area of the county, making it relatively easy to get a good grasp of the general situation. Fig. 18, supplemented by Table 6, will be found especially helpful in this connection.

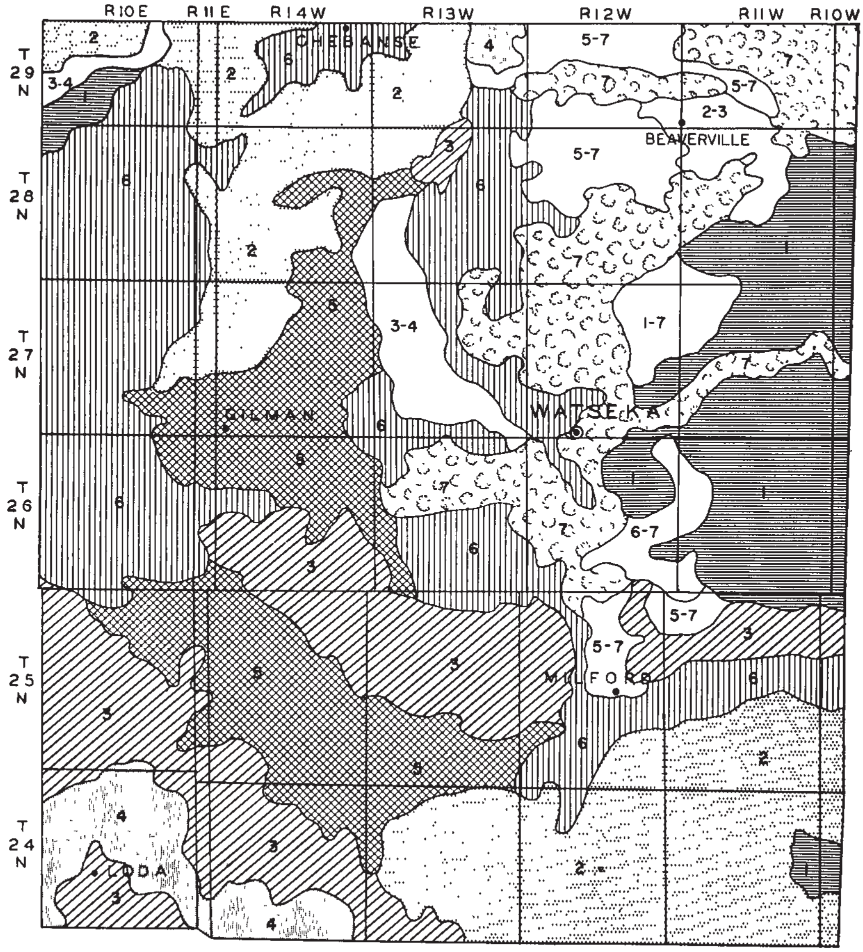
Table 6. — IROQUOIS COUNTY SOILS
Grouped According to Parent Materials, Permeability, Vegetation, and Slope

Underlying materials	Vegetation	Soil type number[a] and predominant slope: Nearly level	Gently sloping	Strongly sloping to steep
Permeable till	Prairie	**59, 67, 152, 196**	**145, 204**	**221**
	Timber	....	**24**	**224**
Moderately slowly permeable till	Prairie	**232, 238**	**146, 157**	**193, 223**
	Timber	....	......	....
Slowly permeable drift	Prairie	**42, 229, 235, 238**	**91**	**231**
	Timber	**228**	**228**	**241**
Very slowly permeable drift	Prairie	**42, 229, 230, 238**	**147**	**231**
	Timber	**228**	**228**	**241**
Moderately slowly permeable outwash	Prairie	**67, 69, 189**	......	....
	Timber	**192**	**192**	**241**
Permeable outwash	Prairie	**67, 101, 102, 130, 149, 151, 152, 153, 196, 206**	**148, 151**	**155**
	Timber	**158**	**158**	....
Rapidly to moderately rapidly permeable outwash, frequently drouthy	Prairie	**49, 89, 196**	**49, 98, 190**	**98**
	Timber	**20**	**90, 131**	**90**

[a] Types 73, 103, 106 are not included in this table because they do not fit into any of the categories.

SUMMARY OF CHARACTERISTICS OF IROQUOIS COUNTY SOILS

A summary of the agriculturally more significant characteristics of the soil types shown on the colored soil map is given in Table 7, page 56. The information is necessarily general and does not mean that every farm or every field of a given soil type exhibits exactly the same characteristics as there indicated. As already pointed out, productivity varies within areas of the same type because of differences in past management. These variations in productivity cannot always be detected by the soil surveyor but they are known to the



An important feature to know about a soil is whether it is so tight that it does not underdrain freely or so open that it underdrains too freely and consequently is drouthy. The above map gives this information for Iroquois county soils.

Soils in Areas 1 to 4 are developed on glacial till. They are numbered here in order of *decreasing* permeability and effectiveness of tile.

1 — Moderately permeable to water. Tilable. Chiefly Saybrook, Lisbon, and Drummer.

2 — Moderately slowly permeable. These soils do not tile as well as soils in Area 1 but well enough so that tiling is advised. Chiefly Elliott and Ashkum.

3 — Slowly permeable. Tiling is of questionable value. Chiefly Swygert and Bryce.

4 — Very slowly permeable. Tiling not advised. Chiefly Clarence and Rowe.

Soils in Areas 5 to 7 are developed from glacial outwash. They are numbered here in order of *increasing* permeability and effectiveness of tile.

5 — Moderately slowly permeable. Tile are moderately effective. For best underdrainage the lines should be 4 or 5 rods apart. Soils are chiefly Martinton and Milford.

6 — Moderately permeable. Tile are effective and may be spaced 7 or 8 rods apart. Soils are chiefly Brenton, Drummer, and Pella.

7 — Sandy outwash material. Rapidly to moderately rapidly permeable to water. Tile are not recommended except where there is enough finer material to hold the tile in line. Sandy soils occur to a limited extent in other areas besides those marked.

Paired numbers (1-7, 2-3, 3-4, 5-7, 6-7) indicate areas where the soils are chiefly mixtures consisting mainly of soils in the two groups indicated. Fig. 18

Table 7. — IROQUOIS COUNTY SOILS: Summary of Characteristics and

Type No.	Type name	See page[a]	Topography[b]	Permeability of subsoil[c]	Organic matter
20	Woodland fine sandy loam	19	Nearly level to gently sloping	Moderate	Low
24	Miami silt loam	20	Generally moderately sloping	Moderate	Low
42	Papineau fine sandy loam	20	Nearly level	Moderately slow	Medium
49	Watseka loamy fine sand	21	Nearly level	Moderately rapid	Medium
59	Lisbon silt loam	22	Nearly level	Moderate	High
67	Harpster clay loam	22	Nearly level	Moderate	High
69	Milford clay loam to clay	23	Nearly level	Moderately slow	High
73	Huntsville loam, bottom	24	Nearly level	Moderate	High
89	Iroquois fine sandy loam	24	Nearly level to gently sloping	Rapid	High
90	Plainfield fine sand	25	Nearly level to moderately sloping	Rapid	Low
91	Swygert silt loam to silty clay loam	26	Gently sloping to moderately sloping	Slow	Medium
98	Hagener loamy fine sand	28	Gently sloping to sloping	Rapid	Low
101	Osceola fine sandy loam	28	Nearly level	Slow	Moderately lo
102	LaHogue loam	29	Nearly level to gently sloping	Moderate	Medium
103	Muck	29	Depressional	Moderate	High
106	Turtle Creek clay, bottom	30	Nearly level	Slow	High
130	Pittwood fine sandy loam	30	Nearly level to gently sloping	Moderate	High
131	Alvin fine sandy loam	31	Nearly level to gently sloping	Rapid	Low
145	Saybrook silt loam	31	Gently sloping	Good	Medium
146	Elliott silt loam	32	Gently to moderately sloping	Moderately slow	Medium
147	Clarence silt loam to silty clay loam	35	Gently to moderately sloping	Very slow	Medium
148	Proctor silt loam	37	Very gently to moderately sloping	Moderate	Medium
149	Brenton silt loam	37	Nearly level to very gently sloping	Moderate	High
151	Ridgeville fine sandy loam	38	Nearly level to gently sloping	Moderate	Medium
152	Drummer clay loam	38	Nearly level	Moderately slow	High
153	Pella clay loam	39	Nearly level	Moderate	High
155	Proctor silt loam, rolling phase	40	Sloping to strongly sloping	Moderately rapid	Low
157	Rankin sandy loam	40	Gently sloping	Slow	Medium low
158	Vance silt loam	41	Gently sloping	Moderate	Low
189	Martinton silt loam	41	Nearly level	Moderately slow	High
190	Onarga fine sandy loam	42	Gently sloping to sloping	Moderately rapid	Medium
192	Del Rey silt loam	42	Gently sloping	Slow	Low
193	Elliott silt loam, rolling phase	43	Moderately sloping	Moderately slow	Low to mediu
196	Harpster fine sandy loam	43	Nearly level or depressional	Moderate	High
204	Saybrook sandy loam	44	Gently sloping	Moderate	Medium
206	Thorp silt loam	44	Nearly level or depressional	Slow	Medium
221	Saybrook silt loam, rolling phase	45	Moderately sloping	Moderate	Medium
223	Varna silt loam	45	Strongly sloping	Moderately slow	Low
224	Strawn silt loam	46	Strongly sloping	Moderate	Low
228	Eylar silt loam	46	Gently to moderately sloping	Very slow	Low
229	Monee silt loam	47	Nearly level	Very slow	Low
230	Rowe clay loam to clay	48	Nearly level	Very slow	High
231	Clarence silt loam, eroded phase	49	Moderately to strongly sloping	Very slow	Low
232	Ashkum clay loam to silty clay loam	49	Nearly level	Slow	High
235	Bryce clay loam to clay	51	Nearly level	Very slow	High
238	Drummer clay	52	Depressional	Slow	High
241	Eylar silt loam, eroded phase	53	Strongly sloping	Very slow	Low

[a] For description of soil type turn to page indicated.

[b] Topography is expressed by the following terms based upon the respective slopes: *depressional*, sloping inward; *nearly level*, less than 0 percent; *gently sloping*, 1.5 to 3.5 percent; *moderately sloping*, 3.5 to 7 percent; *strongly sloping*, 7 to 15 percent; *steep*, greater than 15 percent.

[c] Of the terms used to express permeability, *moderate* indicates the most desirable condition.

[d] Tendency to erode is the susceptibility of the soil type to erosion when cultivated.

farmer operating the land. By supplementing the *use-and-management* suggestions with his special knowledge, an operator should be able to plan a good soil-management and cropping program for each of the soils on his farm.

The column in Table 7 headed "Tendency to erode" does not indicate the amount of erosion that has already taken place, nor the harmfulness of erosion on the various soils. It indicates only the tendency of each soil to erode. Soils with good parent materials which are deep, such as Saybrook, are less injured by erosion than are soils with poor parent materials near the surface, such as Clarence. Saybrook is injured by erosion, but the removal of the surface horizon does not completely destroy its capacity to produce crops. The removal of the surface soil from Clarence and the other slowly permeable till soils seriously and permanently reduces their agricultural value.

HOW IROQUOIS COUNTY SOILS WERE FORMED

The intelligent use and management of soils does not require a knowledge of the origin of the materials from which the soils developed nor of the processes that were active in their development. Many people, however, are interested in an explanation of facts as well as in the facts themselves. The information given here is intended for those who would like a brief statement of some of the interesting points about the development of Iroquois county soils.

Origin of the soil materials. The upland and terrace soils of Iroquois county have developed from materials deposited during the Glacial Epoch. The bottomland soil materials were deposited by streams during more recent times.

During the Glacial Epoch the climate alternated between long periods when it was much like our climate today and other periods of prolonged cold. In the colder periods the average temperature was so low that the snow which fell in winter did not entirely melt the following summer. As time went on huge amounts of snow and ice piled up in the northern parts of our continent. The pressures that developed in this great ice mass caused it to push outward, forming glaciers (Fig. 19).

Aided by further accumulations of snow and ice at their margins, the glaciers advanced, moving chiefly southward until they reached a region where the climate was warm enough to melt the ice as rapidly as the glacier moved forward. In moving across the country, the ice sheets picked up great masses of rock, gravel, sand, silt, and clay, ground them together, and carried them along. Most of these materials were deposited within a hundred miles or less of the point where they were picked up, but some were carried for hundreds of miles. The moving ice leveled off hills and filled in old valleys, often completely changing the surface features of the areas over which it passed. The mixture of materials left by a glacier is known as *glacial drift* and *glacial till,* terms which appear frequently in descriptions of soils.

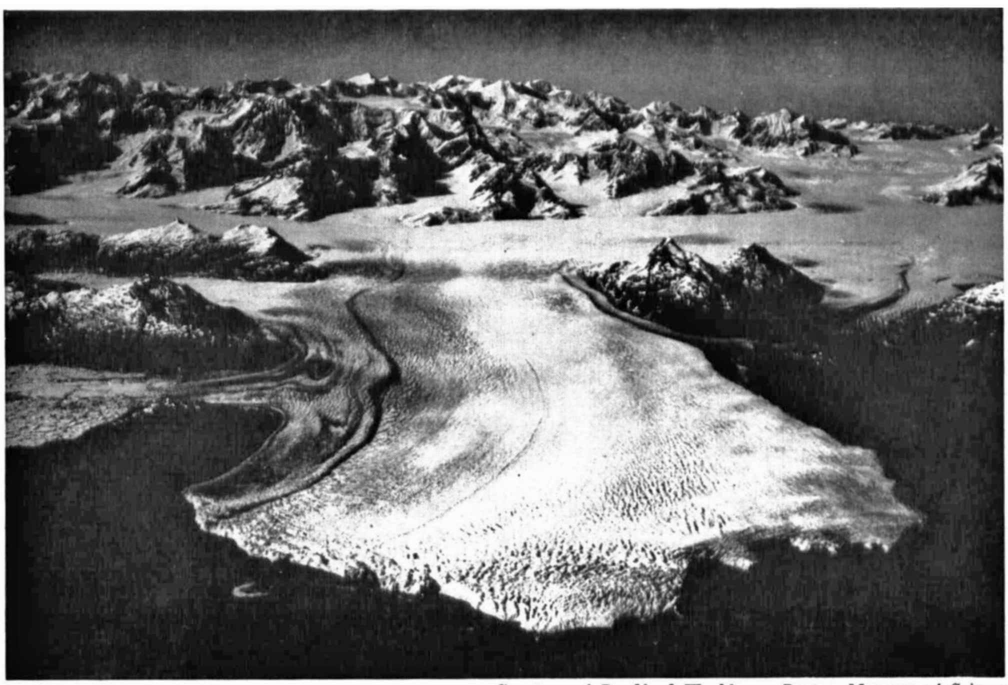
The area that is now Iroquois county was covered by at least two of the four major advances of glacial ice from the north, but only the last, called the Wisconsin ice sheet, had much influence on the soils of the county. The retreat, or melting back, of this glacier was not a continuous process but was often inter-

rupted. Besides the periods when the ice advanced, there were long periods when the margins of the ice were nearly stationary. During these long nearly stationary periods the ice melted as rapidly as it pushed forward, and the sediments deposited by the melting ice piled up in the form of ridges, or moraines. The Marseilles moraine, in the northwest corner of Iroquois county, was formed in this way.

As the glacial ice melted, a shallow lake was formed which covered much of the area now known as Iroquois county. The fine-textured sediments deposited in this lake are very slowly permeable to water and interfere with underdrainage. In the northeastern part of the county, running water deposited coarse sediments from which the sandy soils of that region developed. At about this same time, the winds also laid down a blanket of silt, called *loess*. In Iroquois county the loess is very thin, probably nowhere exceeding 2 feet, but it contributes materially to the quality of the soils of the region.[1]

Composition of the soil materials. The nature of any glacial till depends on the

[1] For a more detailed discussion of the geology of Iroquois county see "Glacial Kankakee Torrent in Northeastern Illinois," by G. E. Ekblaw and L. F. Athy in Geological Society of America Bulletin 36, pages 417 to 428, 1925. Also Illinois State Geological Survey Bulletin 66 contains much material bearing on the geology of Iroquois county.



Courtesy of Bradford Washburn, Boston Museum of Science

This picture of the Columbia glacier in Alaska illustrates how glaciers form and move. Note that the small valley glaciers in the background have joined together into a large glacier in the foreground. This larger glacier is pushing into Prince William sound. It is approximately 5 miles across at its widest point and about 800 feet thick at its front. Between 200 and 250 feet of ice show above the water. The dark streaks are glacial till imbedded in the ice. This glacier is very small compared with the ice sheets that covered most of Illinois in past ages. **Fig. 19**

kind of rocks that make it up. In the east-central part of Iroquois county the till is composed of many different materials, mainly coarse-grained igneous rocks, sandstone, some limestone, and a small amount of shale. In other areas of the county, notably in the Loda region, the till is composed almost entirely of shale and limestone, with very little or none of the coarser grained rocks. These differences in the till are of considerable agricultural importance because of their effect on underdrainage. When the till is a mixture of sandstone, limestone, and igneous rocks, with only a small amount of shale, it is permeable to water; when the mixture is mainly shale and limestone, water penetrates it very slowly. Over most of the county, where the underlying till is high in shale, the till comes so near the surface that it interferes with underdrainage and root penetration.

How the soils were developed. As soon as the parent materials — loess, till, or outwash — were deposited, they were subjected to weathering forces, and the processes of soil development began. When first deposited, the parent materials were high in lime and the mineral elements of plant food but very low in nitrogen. As time elapsed, the rain water, the oxygen and carbon dioxide of the air, and the products of decaying plants attacked the minerals, leaching out the free lime and changing some of the minerals into clay.

Since the forces that cause weathering are most active near the surface of the soil and less active with increasing depth, various stages of weathering occur at different depths. Thus carbonates are leached first from the surface, and it is there that the minerals are broken down most rapidly. Most of the organic matter accumulates in the surface, as is indicated by the darker color of the surface soil. The clay particles that form at or near the surface are gradually carried downward by the percolating waters to a point where they accumulate, forming a subsoil high in clay. Thus horizons or layers differing in physical and chemical composition gradually develop, and the parent material takes on characteristics that justify its being called a soil.

As soon as the physical and chemical forces of weathering began acting on the slowly soluble minerals, plant nutrients in available form were released. Then vegetation started spreading over the land, more slowly perhaps in the regions where the till contained more shale.

Two types of vegetation — prairie and forest — were important influences in the development of the soils of Iroquois county. Where prairie grasses grew, their extensive and fibrous roots decayed in the soil, adding much organic matter and producing the dark soils of the county. Where forests grew for long periods of time, light-colored soils developed. These soils have little organic matter because leaves dropped by the trees stay on the surface of the land and decay rapidly.

Drainage is another great influence on the development of soils. A high water table speeds up the decomposition of minerals but retards leaching and the decay of organic matter. Soils that were wet throughout their development are therefore characterized by a heavier surface texture, less acidity, and more organic matter than those developed under conditions of good drainage.

Not all parent materials are affected to the same extent by the weathering processes. Where they are permeable to water, a large part of the rainfall penetrates deeper into the soil and deeper leaching takes place than where the soil materials absorb water only slowly. Moreover, when water penetrates slowly,

more of it runs off the surface and there is more rapid loss of soil material by erosion. Thus on the slowly permeable till in Iroquois county we find shallow soils that usually contain lime at a depth of only about 2 or 2½ feet; whereas on moderately permeable till and on outwash, the lime is usually as deep as 3 or 4 feet.

Variations in the soils of Iroquois county, as elsewhere, thus trace back to differences in the parent materials, in the native vegetation, the drainage, and the topography, or "lay of the land."

GEOGRAPHICAL AND HISTORICAL FEATURES

Physiography and drainage. Iroquois county is located in a region of low relief. It is less rolling than the counties to the south and west. Low morainal ridges cross the northwestern and southeastern corners, and the east-central part in the region of Sheldon is also morainal. Much of the rest of the county was once occupied by a glacial lake, known as Lake Watseka. The drainage of the county, except for a small area in the southeastern corner and along the western side, is through Iroquois river and its tributaries into Kankakee river and finally into the Illinois.

Climate of Iroquois county. The climate of Iroquois county is characteristic of that in the north-central part of the United States. There is a wide range in temperature between the extremes of winter and summer; and the rainfall, though irregularly distributed, is usually abundant, so far as the total annual amount is concerned. Rainless periods long enough to be harmful are, however, not uncommon during the growing season.

The average annual precipitation at Watseka for the fourteen years 1935-1948 was 34.92 inches. The driest year during this period was 1940, with a total precipitation of 27.53 inches; 1942 was the wettest year, with 43.87 inches. The driest months were December, January, and February, with an average of 1.79 inches. The average monthly precipitation for the growing season, April through September, was 3.54 inches.

At Pontiac a longer weather record is available, and the following temperature, frost, and rainfall data for the twenty-one years 1926-1946 are based upon records of that weather station.

The mean summer temperature during this period was 74.2° F., the mean winter temperature 28.3°, and the average mean yearly temperature 52.6°. The highest temperature recorded was 108° in July, 1936, and the lowest was –24° in January, 1927. Temperatures between 90° and 100° F. are common during June, July, and August.

The average date of the last killing frost in the spring was April 24 and that of the first killing frost in the fall was October 13. This gives an average frost-free season of 172 days. A growing season of this length provides ample time for all corn-belt crops to reach maturity. The latest recorded killing frost in the spring was on May 13, 1938, and the earliest in the fall on September 27, 1942. The shortest growing season, 152 days, occurred in 1941 and the longest, 209 days, in 1931.

The average annual precipitation at Pontiac for these twenty-one years was 35.43 inches, including the water melted from an average snowfall of 26.4 inches (about 10 inches of snow being equivalent to 1 inch of rainfall). The driest year during this period was 1930, with

a total precipitation of 22.63 inches; while 1927 was the wettest, with 47.43 inches of precipitation. The driest month, on the average, was February, with average precipitation of 1.48 inches. April, May, June, August, and September each averaged 3 inches or more, and July had an average rainfall of 2.84 inches.

The distribution of rainfall during the growing season is of great interest to farmers. Rainless periods[1] of 21 days or longer occurred 52 times at Pontiac during the growing season in the 21-year period 1926-1946. The longest rainless period was 103 days in 1934, and the next longest was 86 days in 1936. A rainless period long enough to be more or less harmful to growing crops, even on the better soils, occurs nearly every year.

Settlement of Iroquois county. Iroquois county, the third largest county in Illinois, with a measured area of 1,175 square miles, lies along the Indiana line in east-central Illinois. It was established by legislative act on February 26, 1833, and originally included all of what is now Kankakee county and about half of Will county. In 1836 its northern boundary was moved south to Kankakee river, and in 1853 the southern boundary of Kankakee county became the northern boundary of Iroquois county.

The population increased slowly from 1840 to 1850. From 1850 to 1880 there was a rapid and constant increase to about 35,000. Since 1880 the population has been quite constant, reaching a high of 38,014 in 1900, followed by a slow but constant decline to about 32,275 according to preliminary data from the 1950 Census (see Fig. 20, page 62).

Transportation facilities are well established. Four railroads cross Iroquois county, three north and south and one east and west. Paved highways are easily reached from all points in the county and the secondary road system is well developed. Nearly every farmstead in the county is provided with an all-weather road.

Agricultural production.[2] Agriculture is the leading industry in Iroquois county. The major portion of the county is tillable, and many of the soils, when well farmed, are productive.

Corn is an important crop from the standpoint of both acreage and value. For the ten years 1940-1949 the average yearly acreages of the chief crops were:

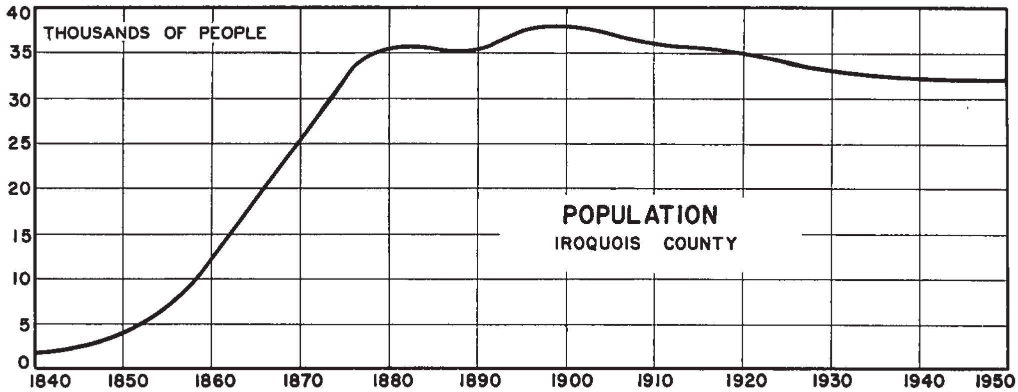
	Acres
Corn	264,700
Oats	132,800
Soybeans	102,100
Hay	37,300
Wheat	3,700

In 1945 there were 16,877 acres in woodland in Iroquois county and 94,216 acres in pasture.

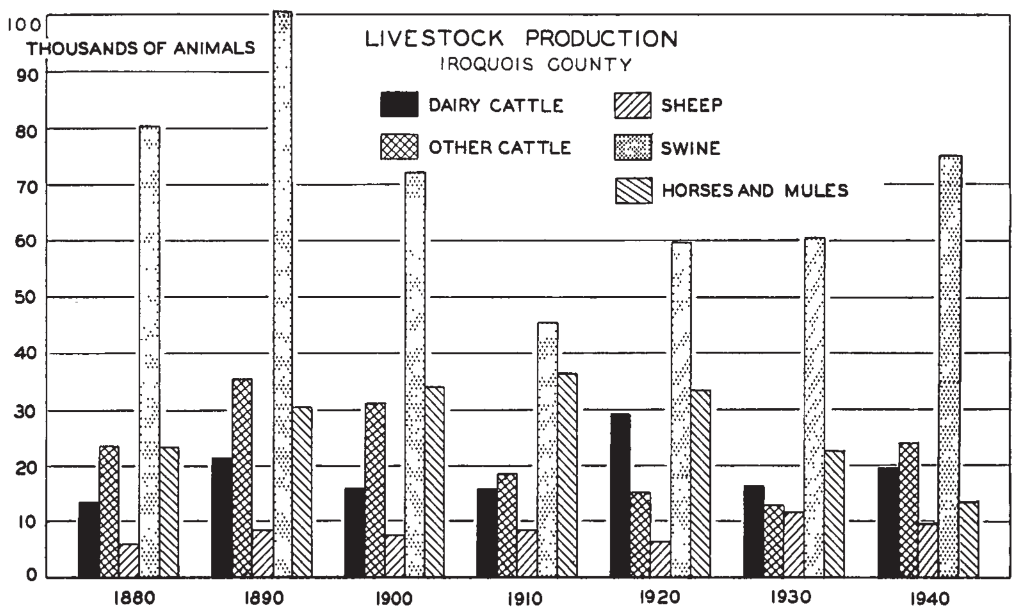
Livestock and livestock products are important in Iroquois county, as shown by Fig. 21 on page 62. This diagram indicates the number of dairy cattle, other cattle, sheep, swine, and horses and mules in the county at ten-year intervals from 1880 to 1940.

[1] The term "rainless period" as used in this report means an interval during which no precipitation exceeding ½ inch is recorded in any consecutive 24 hours.

[2] All crop and livestock statistics are from either the United States Census or *Illinois Crop and Livestock Statistics,* a joint publication of the Illinois State Department of Agriculture and the U. S. Department of Agriculture.



The population of Iroquois county reached a peak about 1900 (38,014) according to the U. S. Census. A gradual decline has occurred since that time, until in 1950 the population was about 32,275. Most counties that are predominantly agricultural have shown a similar decline in recent years due to the increasing mechanization of many farm operations and the associated movement of farm population to urban areas. Fig. 20



Wide fluctuations have occurred in the numbers of the various classes of livestock kept on the farms of Iroquois county during the sixty years represented in this graph. This is especially true of the numbers of hogs and horses and mules. From 1910 to 1940 the numbers of swine increased while the numbers of horses and mules steadily declined. Fig. 21

MEANINGS OF SOME TECHNICAL TERMS

Alluvial sediment — particles of matter of different size carried by running water and left on the flood plains.

Calcareous — said of a soil that contains enough limestone to effervesce, or bubble, when dilute hydrochloric (muriatic) acid is poured on it.

Compact — said of soils that are difficult to penetrate, being made up of particles closely packed and sometimes weakly cemented together.

Concretions — small hard nodules, or lumps, of mixed composition, shapes, and coloring. (Limestone concretions and dark rounded pellets of iron-manganese are common.)

Depressional — a term applied to low-lying areas where there are no surface outlets for the water that accumulates or only poorly developed outlets.

Drift — *see* Glacial drift.

Friable — easily crumbled or crushed in the fingers; a desirable physical condition in soils.

Glacial drift — any materials carried by the ice or waters of glaciers and deposited either as layers of particles sorted by size or as mixed materials.

Glacial till — mixed materials deposited by glacial ice and not laid down in layers.

Horizon — *see* Soil horizon.

Incoherent — said of soil material that falls apart easily or that has no cohesion.

Leached — dissolved and washed out of or down through the soil. This has happened with the more soluble materials, such as limestone.

Leguminous — a term applied to plants that have the power to fix nitrogen from the air through bacteria on their roots.

Loess — fine dust or silty material transported by the wind and deposited on the land. In the Midwest the loess is largely of glacial origin. The grinding action of the glacial ice reduced great quantities of rocks to "rock flour." This fine material was, for the most part, deposited as sediment by glacial streams in their flood stage. Later, during dry periods, it was picked up by the wind and deposited on the surrounding areas.

Manure system — a system of farming which makes use of animal manure, including litter, which is plowed down for corn in amounts equal to the dry weight of grain and roughage removed during the previous rotation.

Neutral — said of soils whose reaction is neither acid nor alkaline.

Outwash, glacial outwash — sediment, often sandy and gravelly, deposited in layers in valleys or on plains by water from a melting ice sheet.

Percent slope — the slant or gradient of a slope stated in percent; for example, a 15-percent slope is a slope that drops 15 feet in 100 feet.

Plastic — said of soils that are capable of being molded or modeled without breaking up; an undesirable condition, the opposite of friable.

Plowsole — a dense, compacted layer of soil just beneath the surface, which interferes with root penetration and the movement of moisture.

Profile — *see* Soil profile.

Residues system — a system of farming in which the cornstalks, grain and soybean straw, second crop of legume hay, and leguminous green manure are plowed under. No animal manure is applied.

Soil horizon — a term used for a natural structural division or layer of soil parallel to the land surface and different in appearance and characteristics from the layers above and below it.

Soil profile — a vertical section of soil through and including all its horizons.

Structure aggregate — a cluster or group of soil particles, such as clods, lumps, or granules.

Till — *see* Glacial till.

Topography — the lay of the land surface; as rolling topography, nearly level topography, etc.

Weathered — disintegrated and decomposed by the action of natural elements, such as air, rain, sunlight, freezing, thawing, etc.; said of soils that have been more or less strongly changed physically and chemically and leached.

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* No longer available for distribution.
** Reports 74 for Iroquois county and No. 72 for Livingston county replace Nos. 22 and 25 previously published for these two counties.

Much new information about soils has been obtained since the older soil maps and reports in the above list were printed, especially Nos. 1 to 53 issued before 1933. For many areas this newer information is necessary if the maps and other soil information in the reports are to be correctly interpreted. Help in making these interpretations can be obtained by writing Department of Agronomy, University of Illinois, Urbana.

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WHAT CROPS WILL GROW BEST ON MY FARM?

WHAT TREATMENT DOES MY SOIL NEED TO MAKE IT YIELD ITS BEST?

WHAT YIELDS CAN I EXPECT?

These are the questions this Soil Report aims to answer for the farmers and landowners of Iroquois county. Careful reading will repay all who own or operate farms in this county . . . .

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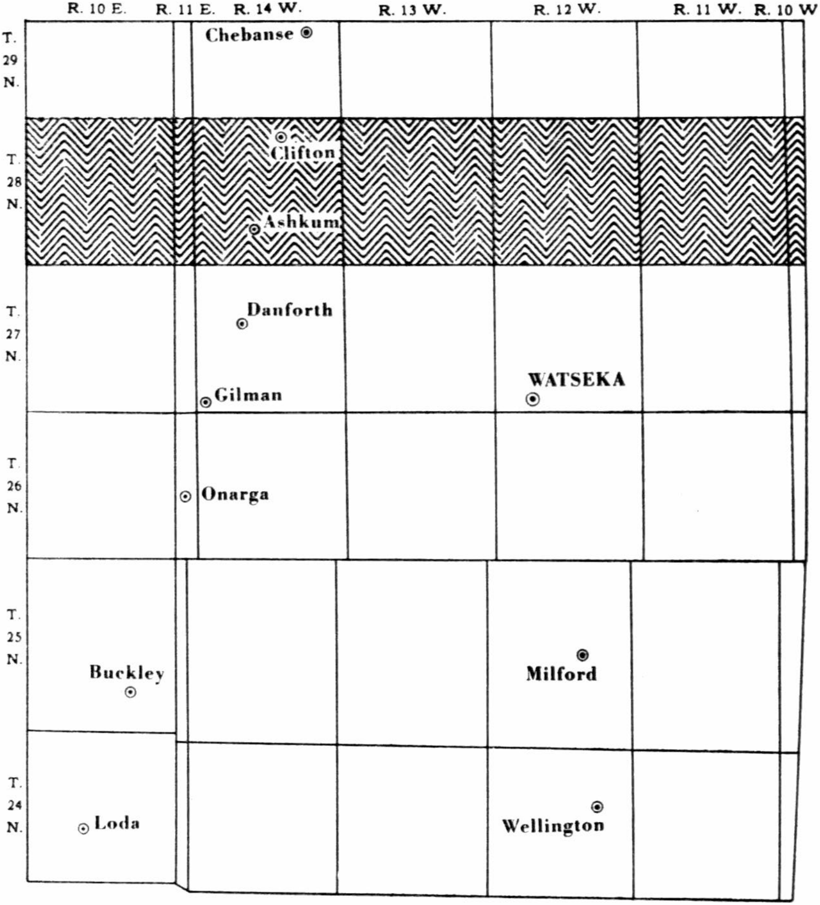
2



LEGEND

20 A	Woodland fine sandy loam
24 B	Miami silt loam
42-49 C	Papineau fine sandy loam — Watseka loamy fine sand, undifferentiated
59 D	Lisbon silt loam
67 E	Harpster clay loam
69	Milford clay loam to clay
73	Huntsville loam, bottom
89	Iroquois fine sandy loam
90	Plainfield fine sand
91	Swygert silt loam to silty clay loam
98 F	Hagener loamy fine sand
101	Osceola fine sandy loam
102 G	La Hogue loam
103	Muck
106	Turtle Creek clay, bottom
130-89 H	Pittwood fine sandy loam — Iroquois fine sandy loam, undifferentiated
131-90 J	Alvin fine sandy loam — Plainfield fine sand, undifferentiated
145	Saybrook silt loam
146 O	Elliott silt loam
147	Clarence silt loam to silty clay loam
148 K	Proctor silt loam
149 L	Brenton silt loam
151-49 M	Ridgeville fine sandy loam — Watseka loamy fine sand, undifferentiated
152	Drummer clay loam
153	Pella clay loam
155	Proctor silt loam, rolling phase
157 N	Rankin sandy loam
158	Vance silt loam
189 P	Martinton silt loam
190-98 Q	Onarga fine sandy loam — Hagener loamy fine sand, undifferentiated
192	Del Rey silt loam
193 R	Elliott silt loam, rolling phase
196 S	Harpster fine sandy loam
204-49 T	Saybrook sandy loam — Watseka loamy fine sand, undifferentiated
206	Thorp silt loam
221 U	Saybrook silt loam, rolling phase
223 V	Varna silt loam
224 W	Strawn silt loam
228	Eylar silt loam
229	Monee silt loam
230	Rowe clay loam to clay
231 X	Clarence silt loam, eroded phase
232	Ashkum clay loam to silty clay loam
235	Bryce clay loam to clay
238 Y	Drummer clay
241 Z	Eylar silt loam, eroded phase

Scale

0 ¼ ½ 1 2 Miles

1940

R. S. Smith, in charge Soil Survey

Soil Surveyed by
Herman Wascher, in charge
J. B. Fehrenbacher
J. S. McVickar
R. T. Odell
T. G. Pearse
F. F. Riecken
G. D. Smith
E. P. Whiteside

SOIL SURVEY MAP OF IROQUOIS COUNTY

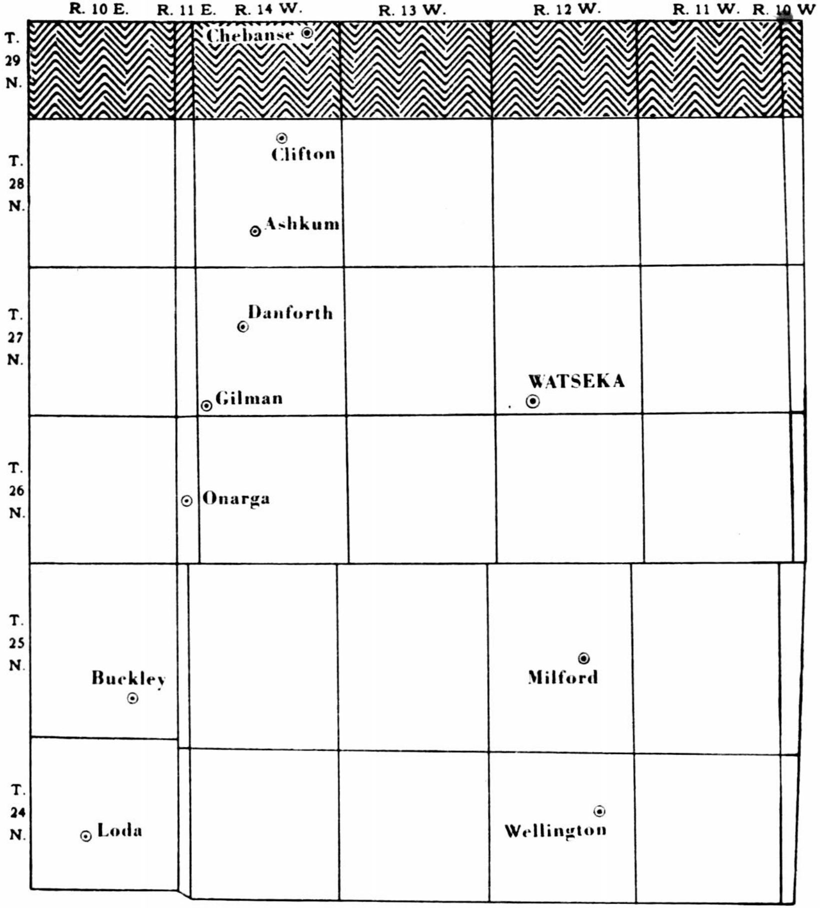
UNIVERSITY OF ILLINOIS AGRICULTURAL EXPERIMENT STATION

CONVENTIONAL SIGNS

- House
- School
- Church
- Elevator
- Other public building
- Cemetery
- Railroad (steam)
- Paved road (two lane)
- Other hard surfaced road
- Improved dirt and oiled road
- Secondary dirt and private road
- Township boundary line
- County boundary line
- State boundary line
- Stream (flowing)
- Stream (intermittent)
- Pond
- Swamp
- Gravel Pit
- Blow out (sand)

1

CHEBANSE SHEET



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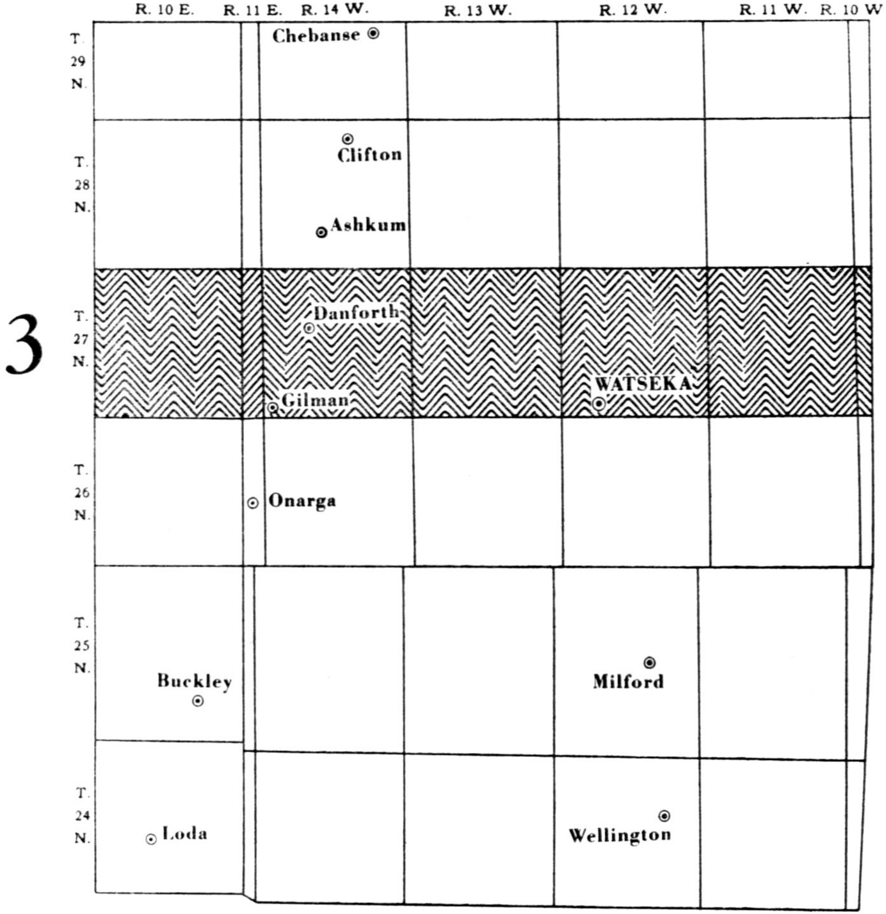
SOIL SURVEY MAP OF IROQUOIS COUNTY

UNIVERSITY OF ILLINOIS AGRICULTURAL EXPERIMENT STATION

CONVENTIONAL SIGNS

House
School
Church
Elevator
Other public building
Cemetery
Railroad (steam)
Paved road (two lane)
Other hard surfaced road
Improved dirt and oiled road
Secondary dirt and private road
Township boundary line
County boundary line
State boundary line
Stream (flowing)
Stream (intermittent)
Pond
Swamp
G. P. Gravel Pit
Blow out (sand)

DANFORTH SHEET



A. Hoen & Co., Inc.

LEGEND

20 A	Woodland fine sandy loam
24 B	Miami silt loam
42-49 C	Papineau fine sandy loam—Watseka loamy fine sand, undifferentiated
59 D	Lisbon silt loam
67 E	Harpster clay loam
69	Milford clay loam to clay
73	Huntsville loam, bottom
89	Iroquois fine sandy loam
90	Plainfield fine sand
91	Swygert silt loam to silty clay loam
98 F	Hagener loamy fine sand
101	Osceola fine sandy loam
102 G	La Hogue loam
103	Muck
106	Turtle Creek clay, bottom
130-89 H	Pittwood fine sandy loam—Iroquois fine sandy loam, undifferentiated
131-90 J	Alvin fine sandy loam—Plainfield fine sand, undifferentiated
145	Saybrook silt loam
146 O	Elliott silt loam
147	Clarence silt loam to silty clay loam
148 K	Proctor silt loam
149 L	Brenton silt loam
151-49 M	Ridgeville fine sandy loam—Watseka loamy fine sand, undifferentiated
152	Drummer clay loam
153	Pella clay loam
155	Proctor silt loam, rolling phase
157 N	Rankin sandy loam
158	Vance silt loam
189 P	Martinton silt loam
190-98 Q	Onarga fine sandy loam—Hagener loamy fine sand, undifferentiated
192	Del Rey silt loam
193 R	Elliott silt loam, rolling phase
196 S	Harpster fine sandy loam
204-49 T	Saybrook sandy loam—Watseka loamy fine sand, undifferentiated
206	Thorp silt loam
221 U	Saybrook silt loam, rolling phase
223 V	Varna silt loam
224 W	Strawn silt loam
228	Eylar silt loam
229	Monee silt loam
230	Rowe clay loam to clay
231 X	Clarence silt loam, eroded phase
232	Ashkum clay loam to silty clay loam
235	Bryce clay loam to clay
238 Y	Drummer clay
241 Z	Eylar silt loam, eroded phase

Scale

0 ¼ ½ 1 2 Miles

1940

R. S. Smith, in charge Soil Survey

Soil Surveyed by
Herman Wascher, in charge
J. B. Fehrenbacher
J. S. McVickar
R. T. Odell
T. G. Pearse
F. F. Riecken
G. D. Smith
E. P. Whiteside

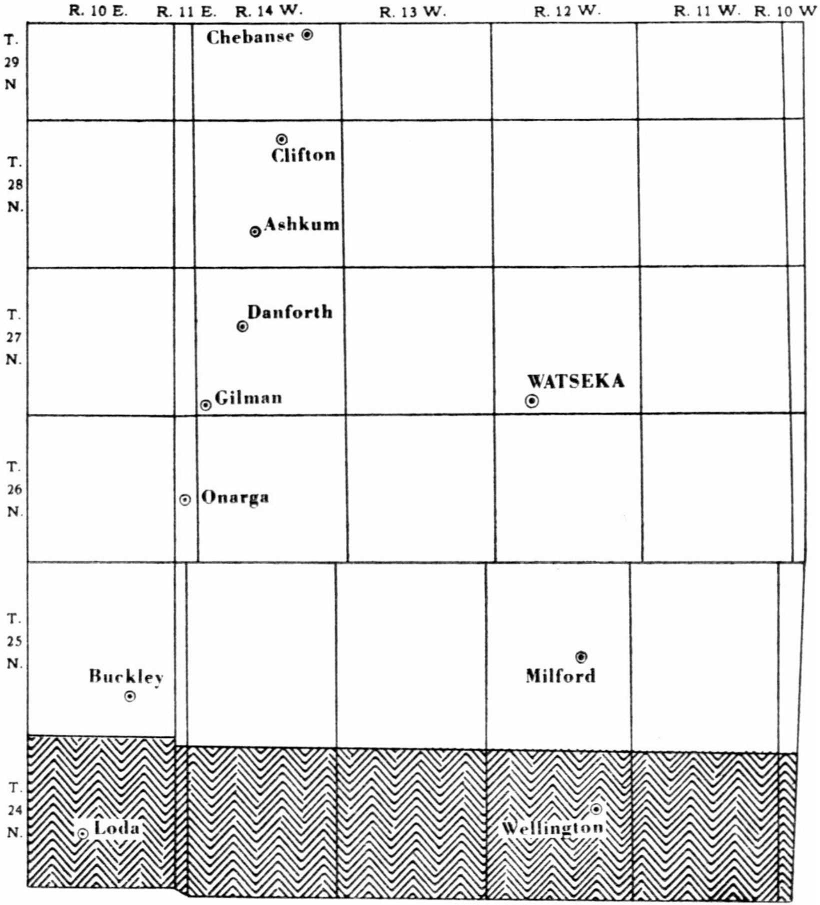
SOIL SURVEY MAP OF IROQUOIS COUNTY

UNIVERSITY OF ILLINOIS AGRICULTURAL EXPERIMENT STATION

CONVENTIONAL SIGNS

House
School
Church
Elevator
Other public building
Cemetery
Railroad (steam)
Paved road (two lane)
Other hard surfaced road
Improved dirt and oiled road
Secondary dirt and private road
Township boundary line
County boundary line
State boundary line
Stream (flowing)
Stream (intermittent)
Pond
Swamp
Gravel Pit
Blow out (sand)

LODA SHEET



R. 10 E.
R. 11 E.
R. 14 W.
R. 13 W.
R. 12 W.
R. 11 W.
R. 10 W
T. 29 N
T. 28 N.
T. 27 N.
T. 26 N.
T. 25 N.
T. 24 N.
Chebanse
Clifton
Ashkum
Danforth
Gilman
WATSEKA
Onarga
Buckley
Milford
Loda
Wellington

6

LEGEND

- 20 A — Woodland fine sandy loam
- 24 B — Miami silt loam
- 42-49 C — Papineau fine sandy loam — Watseka loamy fine sand, undifferentiated
- 59 D — Lisbon silt loam
- 67 E — Harpster clay loam
- 69 — Milford clay loam to clay
- 73 — Huntsville loam, bottom
- 89 — Iroquois fine sandy loam
- 90 — Plainfield fine sand
- 91 — Swygert silt loam to silty clay loam
- 98 F — Hagener loamy fine sand
- 101 — Osceola fine sandy loam
- 102 G — La Hogue loam
- 103 — Muck
- 106 — Turtle Creek clay, bottom
- 130-89 H — Pittwood fine sandy loam — Iroquois fine sandy loam, undifferentiated
- 131-90 J — Alvin fine sandy loam — Plainfield fine sand, undifferentiated
- 145 — Saybrook silt loam
- 146 O — Elliott silt loam
- 147 — Clarence silt loam to silty clay loam
- 148 K — Proctor silt loam
- 149 L — Brenton silt loam
- 151-49 M — Ridgeville fine sandy loam — Watseka loamy fine sand, undifferentiated
- 152 — Drummer clay loam
- 153 — Pella clay loam
- 155 — Proctor silt loam, rolling phase
- 157 N — Rankin sandy loam
- 158 — Vance silt loam
- 189 P — Martinton silt loam
- 190-98 Q — Onarga fine sandy loam — Hagener loamy fine sand, undifferentiated
- 192 — Del Rey silt loam
- 193 R — Elliott silt loam, rolling phase
- 196 S — Harpster fine sandy loam
- 204-49 T — Saybrook sandy loam — Watseka loamy fine sand, undifferentiated
- 206 — Thorp silt loam
- 221 U — Saybrook silt loam, rolling phase
- 223 V — Varna silt loam
- 224 W — Strawn silt loam
- 228 — Eylar silt loam
- 229 — Monee silt loam
- 230 — Rowe clay loam to clay
- 231 X — Clarence silt loam, eroded phase
- 232 — Ashkum clay loam to silty clay loam
- 235 — Bryce clay loam to clay
- 238 Y — Drummer clay
- 241 Z — Eylar silt loam, eroded phase

Scale

0 ¼ ½ 1 2 Miles

1940

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UNIVERSITY OF ILLINOIS AGRICULTURAL EXPERIMENT STATION

CONVENTIONAL SIGNS

- House
- School
- Church
- Elevator
- Other public building
- Cemetery
- Railroad (steam)
- Paved road (two lane)
- Other hard surfaced road
- Improved dirt and oiled road
- Secondary dirt and private road
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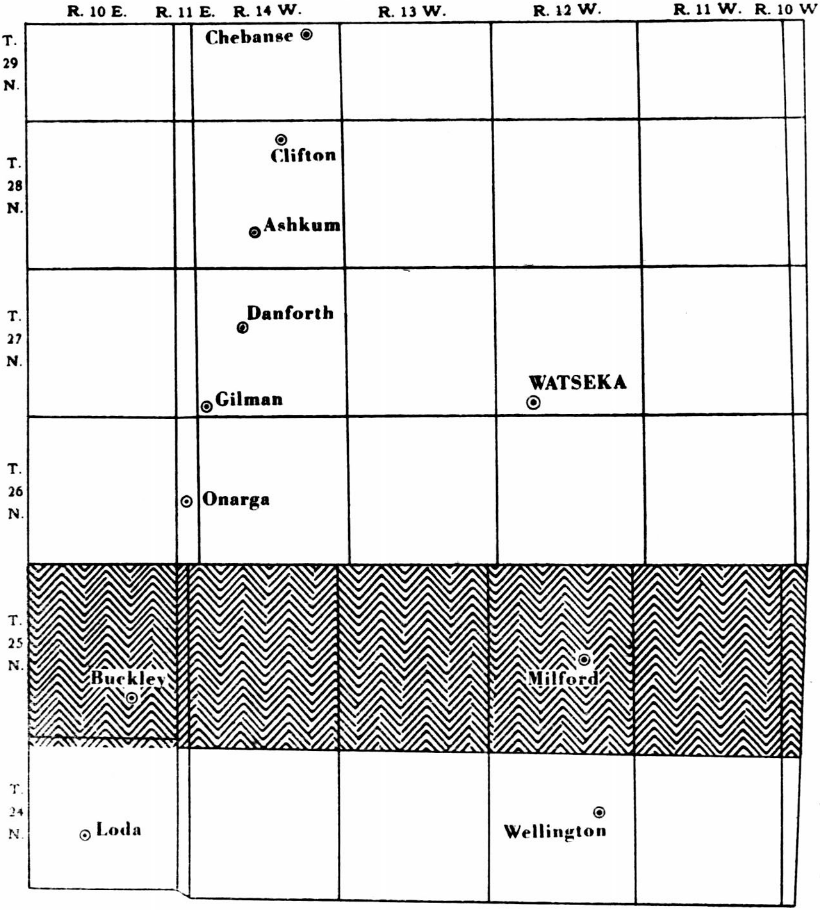
- County boundary line
- State boundary line
- Stream (flowing)
- Stream (intermittent)
- Pond
- Swamp
- G. P. Gravel Pit
- Blow out (sand)

MILFORD SHEET



5

LEGEND

A. Hoen & Co., Inc.

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148 K	Proctor silt loam
149 L	Brenton silt loam
151-49 M	Ridgeville fine sandy loam — Watseka loamy fine sand, undifferentiated
152	Drummer clay loam
153	Pella clay loam
155	Proctor silt loam, rolling phase
157 N	Rankin sandy loam
158	Vance silt loam
189 P	Martinton silt loam
190-98 Q	Onarga fine sandy loam — Hagener loamy fine sand, undifferentiated
192	Del Rey silt loam
193 R	Elliott silt loam, rolling phase
196 S	Harpster fine sandy loam
204-49 T	Saybrook sandy loam — Watseka loamy fine sand, undifferentiated
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221 U	Saybrook silt loam, rolling phase
223 V	Varna silt loam
224 W	Strawn silt loam
228	Eylar silt loam
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235	Bryce clay loam to clay
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Scale

0 ¼ ½ 1 2 Miles

1940

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- House
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- Other hard surfaced road
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- Secondary dirt and private road
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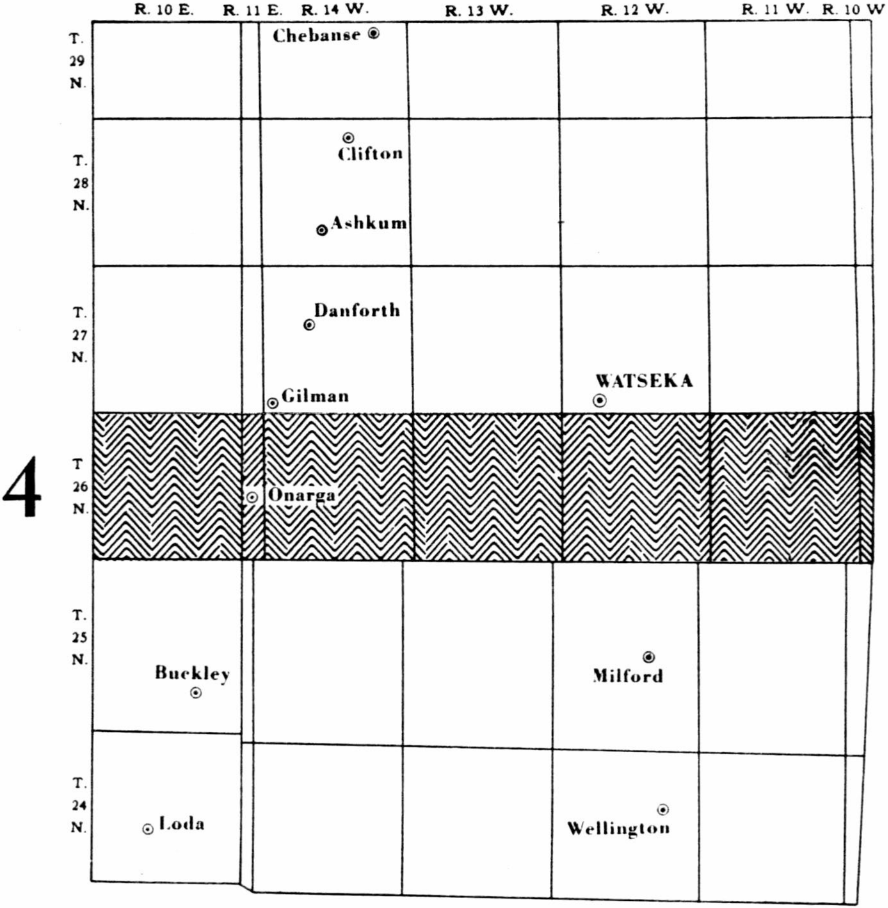
- Township boundary line
- County boundary line
- State boundary line
- G.P. Gravel Pit
- * Blow out (sand)
- Stream (flowing)
- Stream (intermittent)
- Pond
- Swamp

ONARGA SHEET



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